

## CLAIMS

## Load Bed Extension Module:

1. An agricultural bale accumulator comprising:

5 a base module including:

a load bed which is substantially planar for receiving and accumulating thereon a plurality of bales; and

a main frame for supporting the load bed above a ground surface; and

a load bed extension module including:

10 a first extension table which is substantially planar;

a first extension table attachment mechanism connected to the first extension table and the base module to permit the first extension table to be moveable relative to the base module between a stowed position and an unstowed position, wherein the first extension table is substantially co-planar with the load bed and adjacent to a first side of the load bed when the first extension table is in the unstowed position to permit the first extension table to accumulate thereon at least one of the plurality of bales; and

15 a first extension table support system connected to at least one of the base module and the first extension table, wherein the first extension table support system contacts the first extension table at a location beyond the first side of the load bed and contacts at least one of the base module and the ground surface to support the first extension table from at least one of the base module and the ground surface, respectively, when the first extension table is in the unstowed position.

2. An agricultural bale accumulator according to claim 1 wherein the first extension table support system further comprises:

25 a first support wheel connected to the first extension table and moveable with the first extension table when the first extension table moves between the stowed position and the unstowed position, wherein the first support wheel contacts the ground surface to support the first extension table from the ground surface.

3. An agricultural bale accumulator according to claim 2 further comprising:

30 a first wheel and a second wheel coupled to the main frame, wherein the first wheel and the second wheel contact the ground surface to support the base module from the ground surface and to permit the agricultural bale accumulator to be transported across the ground surface, and wherein the first wheel, the second wheel and the first support wheel share a common axis of rotation.

4. An agricultural bale accumulator according to claim 1 wherein the first extension table support system further comprises:

a first frame extension member connected to the first extension table and moveable with the first extension table when the first extension table moves between the stowed position and the unstowed position, wherein an end surface of the first frame extension member contacts an end surface of the base module to support the first extension table from the base module.

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5. An agricultural bale accumulator according to claim 4:

wherein the end surface the first frame extension member has a downward angle relative to a horizontal axis when the first extension table is in the unstowed position,

10 wherein the end surface on the base module has an upward angle relative to the horizontal axis which is complementary to the downward angle, and

wherein the end surface the first frame extension member contacts the end surface on the base module to translate an upward force through the first frame extension member to support the first extension table from the base module.

15 6. An agricultural bale accumulator according to claim 1 wherein the first extension table support system further comprises:

20 a second frame extension member having a first end connected to the base module and a second end connected to the first extension table and being moveable between a collapsed position and an expanded position, wherein the second frame extension member is in the collapsed position when the first extension table is in the unstowed position, wherein the second frame extension member is in the expanded position when the first extension table is in the stowed position, and wherein the second frame extension member is connected to the first extension table and the base module to support the first extension table from the base module.

25 7. An agricultural bale accumulator according to claim 6 wherein the second frame extension member further comprises:

a first hydraulic cylinder for moving the first extension table between the stowed position and the unstowed position responsive to receiving pressurized hydraulic fluid from a hydraulic fluid source.

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8. An agricultural bale accumulator according to claim 6 wherein the second frame extension member further comprises:

35 at least one spring member, connected to at least one of the base module, the first extension table and the second frame extension member, for exerting a bias force on the first extension table when the first extension table is moved to at least one of the stowed position and the unstowed position.

9. An agricultural bale accumulator according to claim 1 wherein the first extension table support system further comprises:

a third frame extension member having a proximal end and a distal end, wherein the proximal end of the third frame extension member is connected to the main frame, wherein a distal end of the third frame extension member extends beyond the main frame in a direction transverse to a traveling direction of the agricultural bale accumulator at a fixed position which is located  
5 inside a road travel width dimension of the agricultural bale accumulator to permit safe traveling of the agricultural bale accumulator on a public roadway when the first extension table is in the stowed position, and

wherein a first portion of the first extension table is positioned inside the distal end of the third frame extension member and a second portion of the first extension table is positioned  
10 outside the distal end of the third frame extension member when the first extension table is in the unstowed position to permit the third frame extension member to contact the first extension table between the first portion of the first extension table and the second portion of the first extension table to support the first extension table from the main frame.

10. An agricultural bale accumulator according to claim 1 wherein the first extension table support system further comprises:

a fourth frame extension member having a proximal end and a distal end; and

a frame attachment mechanism connected to the proximal end of the fourth frame extension member and the main frame to permit the distal end of the fourth frame extension member to be  
20 moveable relative to the main frame between a stowed position and an unstowed position, wherein the distal end of the fourth frame extension member moves towards the main frame when the fourth frame extension member is in the stowed position, wherein the distal end of the fourth frame extension member moves away from the main frame when the fourth frame extension member is in the unstowed position, wherein the distal end of the fourth frame extension member  
25 contacts the first extension table to support the first extension table from the main frame when the fourth frame extension member is in the unstowed position.

11. An agricultural bale accumulator according to claim 10 wherein the frame attachment mechanism further comprises:

30 a pivoting mechanism for pivotally connecting the proximal end of the fourth frame extension member to the main frame about a vertical axis relative to the main frame.

12. An agricultural bale accumulator according to claim 10 wherein the frame attachment mechanism further comprises:

35 a telescoping mechanism for telescopically connecting the proximal end of the fourth frame extension member to the main frame along a horizontal axis relative to the main frame.

13. An agricultural bale accumulator according to claim 10 wherein the first extension table support system further comprises:

a first support wheel connected to the distal end of the fourth frame extension member and moveable with the fourth frame extension member when the fourth frame extension member moves between the stowed position and the unstowed position, wherein the first support wheel contacts the ground surface to support the first extension table from the ground surface and when the fourth frame extension member is in the unstowed position.

14. An agricultural bale accumulator according to claim 13:

wherein the first support wheel provides a sole support for a first side of the base module from the ground surface to permit the agricultural bale accumulator to be transported across the ground surface when the first extension table is in the stowed position and when the fourth frame extension member is in the stowed position, and wherein the first support wheel provides the sole support for the first side of the base module and the first extension table from the ground surface to permit the agricultural bale accumulator to be transported across the ground surface when the first extension table is in the unstowed position and when the fourth frame extension member is in the unstowed position.

15. An agricultural bale accumulator according to claim 13 further comprising:

a first wheel and a second wheel coupled to the main frame, wherein the first wheel and the second wheel contact the ground surface to support the base module from the ground surface and to permit the agricultural bale accumulator to be transported across the ground surface when the first extension table is in the stowed position and the unstowed position and when the fourth frame extension member is in the stowed position and the unstowed position, wherein the first support wheel contacts the ground surface to support the first extension table from the ground surface when the fourth frame extension member is in the unstowed position, and wherein the first wheel, the second wheel and the first support wheel share a common axis of rotation when the fourth frame extension member is in at least the unstowed position.

16. An agricultural bale accumulator according to claim 1 wherein the load bed extension module further comprises:

a second extension table which is substantially planar;

a second extension table attachment mechanism connected to the second extension table and the base module to permit the second extension table to be moveable relative to the base module between a stowed position and an unstowed position, wherein the second extension table is substantially co-planar with the load bed and adjacent to a second side of the load bed when the second extension table is in the unstowed position to permit the second extension table to accumulate thereon at least one of the plurality of bales; and

a second extension table support system connected to at least one of the base module and the second extension table, wherein the second extension table support system contacts the second extension table at a location beyond the second side of the load bed and contacts at least one of the base module and the ground surface to support the second extension table from at least one of the



base module and the ground surface, respectively, when the second extension table is in the unstowed position.

17. An agricultural bale accumulator according to claim 1 wherein the load bed extension module further comprises:

a third extension table which is substantially planar;

a third extension table attachment mechanism connected to the third extension table and the first extension table to permit the third extension table to be moveable with the first extension table relative to the base module when the first extension table moves between the stowed position and the unstowed position, wherein the third extension table is moveable between a stowed position and an unstowed position relative to the first extension table, wherein the third extension table is substantially co-planar with the load bed and the first extension table and adjacent to the first extension table when the first extension table and the third extension table are each in their unstowed positions to permit the third extension table to accumulate thereon at least one of the plurality of bales; and

a third extension table support system connected to at least one of the base module, the first extension table and the third extension table, wherein the third extension table support system contacts the third extension table at a location beyond the first extension table and contacts at least one of the base module, the first extension table and the ground surface to support the third extension table from at least one of the base module, the first extension table and the ground surface, respectively, when the first extension table and the third extension table are each in their unstowed positions.

18. An agricultural bale accumulator according to claim 17:

wherein the first extension table attachment mechanism further comprises a first hinge for pivotally connecting the first extension table to the base module about a first hinge axis,

wherein the third extension table attachment mechanism further comprises a third hinge for pivotally connecting the third extension table to the first extension table about a third hinge axis,

wherein the first extension table pivots upwards towards the base module about the first hinge axis when the first extension table is in the stowed position, and

wherein the third extension table pivots upwards towards the base module and the first extension table about the third hinge axis when the third extension table is in the stowed position.

19. An agricultural bale accumulator according to claim 17:

wherein the first extension table attachment mechanism further comprises a first hinge for pivotally connecting the first extension table to the base module about a first hinge axis,

wherein the third extension table attachment mechanism further comprises a third hinge for pivotally connecting the third extension table to the first extension table about a third hinge axis,

wherein the first extension table pivots upwards towards the base module about the first hinge axis when the first extension table is in the stowed position, and

wherein the third extension table pivots downwards towards the base module and the first extension table about the third hinge axis when the third extension table is in the stowed position.

20. An agricultural bale accumulator according to claim 17:

wherein the first extension table attachment mechanism further comprises a first telescoping mechanism for telescopically connecting a proximal end of the first extension table to the base module along a horizontal axis relative to the base module,

wherein the third extension table attachment mechanism further comprises a first telescoping mechanism for telescopically connecting a proximal end of the third extension table to a distal end of the first extension table along the horizontal axis relative to the base module,

wherein the first extension table telescopes along the horizontal axis to a first position substantially inside the base module when the first extension table is in the stowed position, and wherein the third extension table telescopes along the horizontal axis to a first position substantially inside the first extension table when the third extension table is in the stowed position, and

wherein the first extension table telescopes along the horizontal axis to a second position substantially outside the base module when the first extension table is in the unstowed position, and wherein the third extension table telescopes along the horizontal axis to a second position substantially outside the first extension table when the third extension table is in the unstowed position.

21. An agricultural bale accumulator according to claim 20:

wherein a top surface of the first extension table is lower than a top surface of the load bed by a first predetermined distance when the first extension table is in the unstowed position, and

wherein a top surface of the third extension table is lower than the top surface of the first extension table by a second predetermined distance when the third extension table is in the unstowed position.

22. An agricultural bale accumulator according to claim 1 wherein the load bed extension module is attachable to and detachable from the base module independently of any other module on the agricultural bale accumulator.

23. An agricultural bale accumulator according to claim 1 further comprising:

a first bale position sensor for sensing that at least one of the plurality of bales is disposed on the first extension table.

24. An agricultural bale accumulator according to claim 1 wherein the first extension table attachment mechanism further comprises:

a first hinge for pivotally coupling the first extension table to the base module about a first hinge axis.

25. An agricultural bale accumulator according to claim 1 wherein the load bed receives the plurality of bales in a first direction along a first axis, the agricultural bale accumulator further comprising:

5 a bale transfer module operable to displace the plurality of bales received on the load bed across the load bed and the first extension table in a second direction along a second axis transverse to the first axis to accumulate the plurality of bales on the load bed and the first extension table in a side-by-side relationship when the first extension table is in the unstowed position.

10 26. An agricultural bale accumulator according to claim 1:

a bale discharge module operable to discharge the plurality of bales accumulated on the load bed and the first extension table to the ground surface.

15 27. An agricultural bale accumulator according to claim 26 wherein the bale discharge module further comprises:

at least a portion of the load bed pivotally connected to the main frame about a pivot point disposed on a horizontal pivot axis and moveable relative to the main frame between a bale accumulating position and a bale discharging position, wherein the at least a portion of the load bed is in a horizontal position relative to the main frame when the at least a portion of the load bed is in the bale accumulating position to permit the at least a portion of the load bed and the first extension table to accumulate thereon the plurality of bales, and wherein the at least a portion of the load bed is in an inclined position relative to the main frame when the load bed is in the bale discharging position to permit the at least a portion of the load bed and the first extension table to discharge the plurality of bales accumulated thereon to the ground surface,

wherein the first extension table attachment mechanism connects the first extension table to the at least a portion of the load bed to permit the first extension table to be moveable with the at least a portion of the load bed when the at least a portion of the load bed moves between the bale accumulating position and the bale discharging position, and

30 wherein the first extension table support system contacts the first extension table and contacts at least one of the base module and the ground surface to support the first extension table from at least one of the base module and the ground surface, respectively, when the first extension table is in the unstowed position and when the at least a portion of the load bed moves between the bale accumulating position and the bale discharging position.

35 28. An agricultural bale accumulator according to claim 27 wherein the first extension table support system further comprises:

a first support wheel connected to the first extension table at a location on the horizontal pivot axis and moveable with the first extension table when the first extension table moves between the stowed position and the unstowed position, wherein the first support wheel contacts

the ground surface to support the first extension table from the ground surface about the horizontal pivot axis.

29. An agricultural bale accumulator according to claim 28 further comprising:

5 a first wheel and a second wheel coupled to the main frame on the horizontal pivot axis, wherein the first wheel and the second wheel contact the ground surface to support the base module from the ground surface and to permit the agricultural bale accumulator to be transported across the ground surface, and wherein the first wheel, the second wheel and the first support wheel share a common axis of rotation when the first extension table is in the unstowed position  
10 and when the at least a portion of the load bed is in at least the bale accumulating position.

30. An agricultural bale accumulator according to claim 27 wherein the first extension table support system further comprises:

15 a first frame extension member connected to the first extension table and moveable with the first extension table when the first extension table moves between the stowed position and the unstowed position, wherein an end surface of the first frame extension member contacts an end surface of the base module at the pivot point to support the first extension table from the pivot point on the base module.

20 31. An agricultural bale accumulator according to claim 30:

wherein the end surface the first frame extension member has a downward angle relative to a horizontal axis when the first extension table is in the unstowed position,

wherein the end surface on the base module has an upward angle relative to the horizontal axis which is complementary to the downward angle, and

25 wherein the end surface the first frame extension member contacts the end surface on the base module at the pivot point to translate an upward force through the first frame extension member to support the first extension table from the pivot point on the base module.

32. An agricultural bale accumulator according to claim 27 wherein the first extension table support system further comprises:

30 a second frame extension member having a first end connected to the base module at the pivot point and a second end connected to the first extension table and being moveable between a collapsed position and an expanded position, wherein the second frame extension member is in the collapsed position when the first extension table is in the unstowed position, wherein the  
35 second frame extension member is in the expanded position when the first extension table is in the stowed position, and wherein the second frame extension member is connected to the first extension table and the base module to support the first extension table from the pivot point on the base module.

33. An agricultural bale accumulator according to claim 32 wherein the second frame extension member further comprises:

a first hydraulic cylinder for moving the first extension table between the stowed position and the unstowed position responsive to receiving pressurized hydraulic fluid from a hydraulic fluid source.

34. An agricultural bale accumulator according to claim 33 further comprising:

a second hydraulic fluid cylinder having a first end connected to the main frame and a second end connected to the at least a portion of the load bed, wherein the second cylinder moves the at least a portion of the load bed relative to the main frame between the bale accumulating position and the bale discharging position responsive to receiving pressurized hydraulic fluid from the hydraulic fluid source; and

a hydraulic valve for selectively routing the pressurized hydraulic fluid from the hydraulic fluid source to one of the first hydraulic cylinder and the second hydraulic cylinder responsive to an electric control signal.

35. An agricultural bale accumulator according to claim 32 wherein the first extension table support system further comprises:

at least one spring member, connected to at least one of the base module, the first extension table and the second frame extension member, for exerting a bias force on the first extension table when the first extension table is moved to at least one of the stowed position and the unstowed position.

36. An agricultural bale accumulator according to claim 27 wherein the first extension table support system further comprises:

a third frame extension member having a proximal end and a distal end, wherein the proximal end of the third frame extension member is connected to the main frame, wherein a distal end of the third frame extension member extends beyond the main frame in a direction transverse to a traveling direction of the agricultural bale accumulator at a fixed position on the horizontal pivot axis which is located inside a road travel width dimension of the agricultural bale accumulator to permit safe traveling of the agricultural bale accumulator on a public roadway when the first extension table is in the stowed position, and

wherein a first portion of the first extension table is positioned inside the distal end of the third frame extension member and a second portion of the first extension table is positioned outside the distal end of the third frame extension member when the first extension table is in the unstowed position to permit the distal end of the third frame extension member to contact the first extension table at the fixed position on the horizontal pivot axis between the first portion of the first extension table and the second portion of the first extension table to support the first extension table from the main frame about the horizontal pivot axis.

37. An agricultural bale accumulator according to claim 27 wherein the first extension table support system further comprises:

a fourth frame extension member having a proximal end and a distal end; and

a frame attachment mechanism connected to the proximal end of the fourth frame extension member and the main frame to permit the distal end of the fourth frame extension member to be moveable relative to the main frame between a stowed position and an unstowed position, wherein the distal end of the fourth frame extension member moves towards the main frame when the fourth frame extension member is in the stowed position, wherein the distal end of the fourth frame extension member moves away from the main frame to a position on the horizontal pivot axis when the fourth frame extension member is in the unstowed position, wherein the distal end of the fourth frame extension member contacts the first extension table at the position on the horizontal pivot axis to support the first extension table from the main frame about the horizontal pivot axis when the fourth frame extension member is in the unstowed position.

38. An agricultural bale accumulator according to claim 37 wherein the frame attachment mechanism further comprises:

a pivoting mechanism for pivotally connecting the proximal end of the fourth frame extension member to the main frame about a vertical axis relative to the main frame.

39. An agricultural bale accumulator according to claim 37 wherein the frame attachment mechanism further comprises:

a telescoping mechanism for telescopically connecting the proximal end of the fourth frame extension member to the main frame along a horizontal axis relative to the main frame.

40. An agricultural bale accumulator according to claim 37 wherein the first extension table support system further comprises:

a first support wheel connected to the distal end of the fourth frame extension member and moveable with the fourth frame extension member when the fourth frame extension member moves between the stowed position and the unstowed position, wherein the first support wheel contacts the ground surface to support the first extension table from the ground surface when the fourth frame extension member is in the unstowed position.

41. An agricultural bale accumulator according to claim 40:

wherein the first support wheel provides a sole support a first side of the base module from the ground surface to permit the agricultural bale accumulator to be transported across the ground surface when the first extension table is in the stowed position and when the fourth frame extension member is in the stowed position, and wherein the first support wheel provides the sole support the first side of the base module and the first extension table from the ground surface to

permit the agricultural bale accumulator to be transported across the ground surface when the fourth frame extension member is in the unstowed position.

42. An agricultural bale accumulator according to claim 40 further comprising:

5 a first wheel and a second wheel coupled to the main frame, wherein the first wheel and the second wheel contact the ground surface to support the base module from the ground surface and to permit the agricultural bale accumulator to be transported across the ground surface, wherein the first support wheel contacts the ground surface to support the first extension table from the ground surface when the first extension table is in the unstowed position, when the  
10 fourth frame extension member is in the unstowed position and when the at least a portion of the load bed moves between the bale accumulating position and the bale discharging position, and wherein the first wheel, the second wheel and the first support wheel share a common axis of rotation.

15 43. An agricultural bale accumulator according to claim 27 further comprising:

an alignment mechanism for aligning the at least a portion of the load bed with the main frame when the at least a portion of the load bed is in the bale accumulating position.

44. An agricultural bale accumulator according to claim 27 further comprising:

20 a latch mechanism for latching the at least a portion of the load bed to the main frame when the at least a portion of the load bed is in the bale accumulating position and for unlatching the at least a portion of the load bed from the main frame when the at least a portion of the load bed is in the bale discharging position.

25 45. An agricultural bale accumulator according to claim 27 wherein the load bed extension module further comprising:

a second extension table which is substantially planar;

30 a second extension table attachment mechanism connected to the second extension table and the base module to permit the second extension table to be moveable relative to the base module between a stowed position and an unstowed position, wherein the second extension table is substantially co-planar with the load bed and adjacent to a second side of the load bed when the second extension table is in the unstowed position to permit the second extension table to accumulate thereon at least one of the plurality of bales when the at least a portion of the load bed is in the bale accumulating position; and

35 a second extension table support system connected to at least one of the base module and the second extension table, wherein the second extension table support system contacts the second extension table at a location beyond the second side of the load bed and contacts at least one of the base module and the ground surface to support the second extension table from at least one of the base module and the ground surface, respectively, when the second extension table is in the

unstowed position and when the at least a portion of the load bed moves between the bale accumulating position and the bale discharging position.

46. An agricultural bale accumulator according to claim 27 further comprising:

a third extension table which is substantially planar;

a third extension table attachment mechanism connected to the third extension table and the first extension table to permit the third extension table to be moveable with the first extension table relative to the base module when the first extension table moves between the stowed position and the unstowed position, wherein the third extension table is moveable between a stowed position and an unstowed position relative to the first extension table, wherein the third extension table is substantially co-planar with the load bed and the first extension table and adjacent to the first extension table when the first extension table and the third extension table are each in their unstowed positions to permit the third extension table to accumulate thereon at least one of the plurality of bales when the at least a portion of the load bed is in the bale accumulating position; and

a third extension table support system connected to at least one of the base module, the first extension table and the third extension table, wherein the third extension table support system contacts the third extension table at a location beyond the first extension table and contacts at least one of the base module, the first extension table and the ground surface to support the third extension table from at least one of the base module, the first extension table and the ground surface, respectively, when the first extension table and the third extension table are each in their unstowed positions and when the at least a portion of the load bed moves between the bale accumulating position and the bale discharging position.

47. An agricultural bale accumulator according to claim 46:

wherein the first extension table attachment mechanism further comprises a first hinge for pivotally connecting the first extension table to the base module about a first hinge axis,

wherein the third extension table attachment mechanism further comprises a third hinge for pivotally connecting the third extension table to the first extension table about a third hinge axis,

wherein the first extension table pivots upwards towards the base module about the first hinge axis when the first extension table is in the stowed position, and

wherein the third extension table pivots upwards towards the base module and the first extension table about the third hinge axis when the third extension table is in the stowed position.

48. An agricultural bale accumulator according to claim 46:

wherein the first extension table attachment mechanism further comprises a first hinge for pivotally connecting the first extension table to the base module about a first hinge axis,

wherein the third extension table attachment mechanism further comprises a third hinge for pivotally connecting the third extension table to the first extension table about a third hinge axis,



wherein the first extension table pivots upwards towards the base module about the first hinge axis when the first extension table is in the stowed position, and

wherein the third extension table pivots downwards towards the base module and the first extension table about the third hinge axis when the third extension table is in the stowed position.

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49. An agricultural bale accumulator according to claim 46:

wherein the first extension table attachment mechanism further a first telescoping mechanism for telescopically connecting a proximal end of the first extension table to the base module along a horizontal axis relative to the base module,

10 wherein the third extension table attachment mechanism further comprises a first telescoping mechanism for telescopically connecting a proximal end of the third extension table to a distal end of the first extension table along the horizontal axis relative to the base module,

wherein the first extension table telescopes along the horizontal axis to a first position substantially inside the base module when the first extension table is in the stowed position, and

15 wherein the third extension table telescopes along the horizontal axis to a first position substantially inside the first extension table when the third extension table is in the stowed position, and

wherein the first extension table telescopes along the horizontal axis to a second position substantially outside the base module when the first extension table is in the unstowed position,

20 and wherein the third extension table telescopes along the horizontal axis to a second position substantially outside the first extension table when the third extension table is in the unstowed position.

50. An agricultural bale accumulator according to claim 46:

25 wherein a top surface of the first extension table is lower than a top surface of the load bed by a first predetermined distance when the first extension table is in the unstowed position, and

wherein a top surface of the third extension table is lower than the top surface of the first extension table by a second predetermined distance when the third extension table is in the unstowed position.

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51. An agricultural bale accumulator according to claim 27 wherein the load bed extension module is attachable to and detachable from the base module independently of any other module on the agricultural bale accumulator.

35 52. An agricultural bale accumulator according to claim 27 further comprising:

a first bale position sensor for sensing that at least one of the plurality of bales is disposed on the first extension table.

53. An agricultural bale accumulator according to claim 27 wherein the first extension table attachment mechanism further comprises:

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a first hinge for pivotally coupling the first extension table to the base module about a first hinge axis.

54. An agricultural bale accumulator according to claim 27 wherein the load bed receives the plurality of bales in a first direction along a first axis, the agricultural bale accumulator further comprising:

a bale transfer module operable to displace the plurality of bales received on the load bed across the load bed and the first extension table in a second direction along a second axis transverse to the first axis to accumulate the plurality of bales on the load bed and the first extension table in a side-by-side relationship when the first extension table is in the unstowed position and when the at least a portion of the load bed is in the bale accumulating position.

55. An agricultural bale accumulator comprising:

a base module including:

a load bed which is substantially planar for receiving a plurality of bales to accumulate thereon the plurality of bales; and

a main frame for supporting the load bed above a ground surface;

a bale discharge module including at least a portion of the load bed pivotally connected to the main frame about a pivot point disposed on a horizontal pivot axis and moveable relative to the main frame between a bale accumulating position and a bale discharging position, wherein the at least a portion of the load bed is in a horizontal position relative to the main frame when the at least a portion of the load bed is in the bale accumulating position to permit the at least a portion of the load bed to accumulate thereon the plurality of bales, and wherein the at least a portion of the load bed is in an inclined position relative to the main frame when the load bed is in the bale discharging position to permit the at least a portion of the load bed to discharge the plurality of bales accumulated thereon to the ground surface;

a load bed extension module including:

a first extension table which is substantially planar;

a first hinge for pivotally connecting the first extension table to the at least a portion of the load bed about a first hinge axis to permit the first extension table to be moveable relative to the at least a portion of the load bed between a stowed position and an unstowed position and to permit the first extension table to be moveable with the at least a portion of the load bed when the at least a portion of the load bed moves between the bale accumulating position and the bale discharging position, wherein the first extension table is substantially co-planar with the at least a portion of the load bed and adjacent to a first side of the at least a portion of the load bed when the first extension table is in the unstowed position to permit the first extension table to accumulate thereon at least one of the plurality of bales when the at least a portion of the load bed is in the bale accumulating position; and

a first extension table support system connected to at least one of the base module and the first extension table, wherein the first extension table support system contacts the first

extension table at a location beyond the first side of the load bed and contacts at least one of the base module and the ground surface to support the first extension table from at least one of the base module and the ground surface, respectively, when the first extension table is in the unstowed position and when the at least a portion of the load bed is in at least one of the bale accumulating position and the bale discharging position; and

a bale transfer module operable to distribute the plurality of bales received on the load bed across the load bed and the first extension table to accumulate the plurality of bales on the load bed and the first extension table when the first extension table is in the unstowed position and when the at least a portion of the load bed is in the bale accumulating position.

56. An agricultural bale accumulator according to claim 55 wherein the first extension table support system supports the first extension table at a location between a front side of the load bed where the plurality of bales are received on the load bed and the horizontal pivot axis when the first extension table is in the unstowed position and when the at least a portion of the load bed is in the bale accumulating position.

57. An agricultural bale accumulator according to claim 56 wherein the first extension table support system further comprises:

a first support wheel connected to the first extension table and moveable with the first extension table when the first extension table moves between the stowed position and the unstowed position, wherein the first support wheel contacts the ground surface to support the first extension table from the ground surface.

58. An agricultural bale accumulator according to claim 57 further comprising:

a first wheel and a second wheel coupled to the main frame, wherein the first wheel and the second wheel contact the ground surface to support the base module from the ground surface and to permit the agricultural bale accumulator to be transported across the ground surface, and wherein the first wheel, the second wheel and the first support wheel share a common axis of rotation.

59. An agricultural bale accumulator according to claim 56 wherein the first extension table support system further comprises:

a first frame extension member connected to the first extension table and moveable with the first extension table when the first extension table moves between the stowed position and the unstowed position, wherein an end surface of the first frame extension member contacts an end surface of the base module to support the first extension table from the base module.

60. An agricultural bale accumulator according to claim 59:

wherein the end surface the first frame extension member has a downward angle relative to a horizontal axis when the first extension table is in the unstowed position,

wherein the end surface on the base module has an upward angle relative to the horizontal axis which is complementary to the downward angle, and

wherein the end surface the first frame extension member contacts the end surface on the base module to translate an upward force through the first frame extension member to support the first extension table from the base module.

61. An agricultural bale accumulator according to claim 56 wherein the first extension table support system further comprises:

a second frame extension member having a first end connected to the base module and a second end connected to the first extension table and being moveable between a collapsed position and an expanded position, wherein the second frame extension member is in the collapsed position when the first extension table is in the unstowed position, wherein the second frame extension member is in the expanded position when the first extension table is in the stowed position, and wherein the second frame extension member is connected to the first extension table and the base module to support the first extension table from the base module.

62. An agricultural bale accumulator according to claim 61 wherein the second frame extension member further comprises:

a first hydraulic cylinder for moving the first extension table between the stowed position and the unstowed position responsive to receiving pressurized hydraulic fluid from a hydraulic fluid source.

63. An agricultural bale accumulator according to claim 62 further comprising:

a second hydraulic fluid cylinder having a first end connected to the main frame and a second end connected to the at least a portion of the load bed, wherein the second cylinder moves the at least a portion of the load bed relative to the main frame between the bale accumulating position and the bale discharging position responsive to receiving pressurized hydraulic fluid from the hydraulic fluid source; and

a hydraulic valve for selectively routing the pressurized hydraulic fluid from the hydraulic fluid source to one of the first hydraulic cylinder and the second hydraulic cylinder responsive to an electric control signal.

64. An agricultural bale accumulator according to claim 61 wherein the second frame extension member further comprises:

at least one spring member, connected to at least one of the base module, the first extension table and the second frame extension member, for exerting a bias force on the first extension table when the first extension table is moved to at least one of the stowed position and the unstowed position.

65. An agricultural bale accumulator according to claim 56 wherein the first extension table support system further comprises:

a third frame extension member having a proximal end and a distal end, wherein the proximal end of the third frame extension member is connected to the main frame, wherein a distal end of the third frame extension member extends beyond the main frame in a direction transverse to a traveling direction of the agricultural bale accumulator at a fixed position which is located inside a road travel width dimension of the agricultural bale accumulator to permit safe traveling of the agricultural bale accumulator on a public roadway when the first extension table is in the stowed position, and

wherein a first portion of the first extension table is positioned inside the distal end of the third frame extension member and a second portion of the first extension table is positioned outside the distal end of the third frame extension member when the first extension table is in the unstowed position to permit the third frame extension member to contact the first extension table between the first portion of the first extension table and the second portion of the first extension table to support the first extension table from the main frame.

66. An agricultural bale accumulator according to claim 56 wherein the first extension table support system further comprises:

a fourth frame extension member having a proximal end and a distal end; and

a frame attachment mechanism connected to the proximal end of the fourth frame extension member and the main frame to permit the distal end of the fourth frame extension member to be moveable relative to the main frame between a stowed position and an unstowed position, wherein the distal end of the fourth frame extension member moves towards the main frame when the fourth frame extension member is in the stowed position, wherein the distal end of the fourth frame extension member moves away from the main frame when the fourth frame extension member is in the unstowed position, wherein the distal end of the fourth frame extension member contacts the first extension table to support the first extension table from the main frame when the fourth frame extension member is in the unstowed position.

67. An agricultural bale accumulator according to claim 66 wherein the frame attachment mechanism further comprises:

a pivoting mechanism for pivotally connecting the proximal end of the fourth frame extension member to the main frame about a vertical axis relative to the main frame.

68. An agricultural bale accumulator according to claim 66 wherein the frame attachment mechanism further comprises:

a telescoping mechanism for telescopically connecting the proximal end of the fourth frame extension member to the main frame along a horizontal axis relative to the main frame.

69. An agricultural bale accumulator according to claim 66 wherein the first extension table support system further comprises:

5 a first support wheel connected to the distal end of the fourth frame extension member and moveable with the fourth frame extension member when the fourth frame extension member moves between the stowed position and the unstowed position, wherein the first support wheel contacts the ground surface to support the first extension table from the ground surface when the fourth frame extension member is in the unstowed position.

70. An agricultural bale accumulator according to claim 69:

10 wherein the first support wheel provides a sole support for a first side of the base module from the ground surface to permit the agricultural bale accumulator to be transported across the ground surface when the first extension table is in the stowed position and when the fourth frame extension member is in the stowed position, and wherein the first support wheel provides the sole support for the first side of the base module and the first extension table from the ground surface to permit the agricultural bale accumulator to be transported across the ground surface when the first extension table is the unstowed position and when the first extension table is in the unstowed position and when the fourth frame extension member is in the unstowed position.

71. An agricultural bale accumulator according to claim 69 further comprising:

20 a first wheel and a second wheel coupled to the main frame, wherein the first wheel and the second wheel contact the ground surface to support the base module from the ground surface and to permit the agricultural bale accumulator to be transported across the ground surface when the first extension table is in the stowed position and the unstowed position and when the fourth frame extension member is in the stowed position and the unstowed position, wherein the first support wheel contacts the ground surface to support the first extension table from the ground surface when the first extension table is the unstowed position and when the fourth frame extension member is in the unstowed position, and wherein the first wheel, the second wheel and the first support wheel share a common axis of rotation when the fourth frame extension member is in at least the unstowed position.

30 72. An agricultural bale accumulator according to claim 55 wherein the first extension table support system supports the first extension table about the horizontal pivot axis when the first extension table is in the unstowed position and when the at least a portion of the load bed is moves between the bale accumulating position and the bale discharging position.

35 73. An agricultural bale accumulator according to claim 72 wherein the first extension table support system further comprises:

40 a first support wheel connected to the first extension table at a location on the horizontal pivot axis and moveable with the first extension table when the first extension table moves between the stowed position and the unstowed position, wherein the first support wheel contacts

the ground surface to support the first extension table from the ground surface about the horizontal pivot axis when the first extension table is in the unstowed position and when the at least a portion of the load bed is moves between the bale accumulating position and the bale discharging position.

5 74. An agricultural bale accumulator according to claim 73 further comprising:

10 a first wheel and a second wheel coupled to the main frame on the horizontal pivot axis, wherein the first wheel and the second wheel contact the ground surface to support the base module from the ground surface and to permit the agricultural bale accumulator to be transported across the ground surface, and wherein the first wheel, the second wheel and the first support wheel share a common axis of rotation.

75. An agricultural bale accumulator according to claim 72 wherein the first extension table support system further comprises:

15 a first frame extension member connected to the first extension table and moveable with the first extension table when the first extension table moves between the stowed position and the unstowed position, wherein a proximal end surface of the first frame extension member contacts an end surface of the base module at the pivot point to support the first extension table from the pivot point on the base module.

20 76. An agricultural bale accumulator according to claim 75:

wherein the proximal end surface the first frame extension member has a downward angle relative to a horizontal axis when the first extension table is in the unstowed position,

wherein the end surface on the base module has an upward angle relative to the horizontal axis which is complementary to the downward angle, and

25 wherein the proximal end surface the first frame extension member contacts the end surface on the base module at the pivot point to translate an upward force through the first frame extension member to support the first extension table from the pivot point on the base module.

30 77. An agricultural bale accumulator according to claim 72 wherein the first extension table support system further comprises:

35 a second frame extension member having a first end connected to the base module at the pivot point and a second end connected to the first extension table and being moveable between a collapsed position and an expanded position, wherein the second frame extension member is in the collapsed position when the first extension table is in the unstowed position, wherein the second frame extension member is in the expanded position when the first extension table is in the stowed position, and wherein the second frame extension member is connected to the first extension table and the base module to support the first extension table from the pivot point on the base module.

78. An agricultural bale accumulator according to claim 77 wherein the second frame extension member further comprises:

a first hydraulic cylinder for moving the first extension table between the stowed position and the unstowed position responsive to receiving pressurized hydraulic fluid from a hydraulic fluid source.

79. An agricultural bale accumulator according to claim 78 further comprising:

a second hydraulic fluid cylinder having a first end connected to the main frame and a second end connected to the at least a portion of the load bed, wherein the second cylinder moves the at least a portion of the load bed relative to the main frame between the bale accumulating position and the bale discharging position responsive to receiving pressurized hydraulic fluid from the hydraulic fluid source; and

a hydraulic valve for selectively routing the pressurized hydraulic fluid from the hydraulic fluid source to one of the first hydraulic cylinder and the second hydraulic cylinder responsive to an electric control signal.

80. An agricultural bale accumulator according to claim 77 wherein the first extension table support system further comprises:

at least one spring member, connected to at least one of the base module, the first extension table and the second frame extension member, for exerting a bias force on the first extension table when the first extension table is moved to at least one of the stowed position and the unstowed position.

81. An agricultural bale accumulator according to claim 72 wherein the first extension table support system further comprises:

a third frame extension member having a proximal end and a distal end, wherein the proximal end of the third frame extension member is connected to the main frame, wherein a distal end of the third frame extension member extends beyond the main frame in a direction transverse to a traveling direction of the agricultural bale accumulator at a fixed position on the horizontal pivot axis which is located inside a road travel width dimension of the agricultural bale accumulator to permit safe traveling of the agricultural bale accumulator on a public roadway when the first extension table is in the stowed position, and

wherein a first portion of the first extension table is positioned inside the distal end of the third frame extension member and a second portion of the first extension table is positioned outside the distal end of the third frame extension member when the first extension table is in the unstowed position to permit the distal end of the third frame extension member to contact the first extension table at the fixed position on the horizontal pivot axis between the first portion of the first extension table and the second portion of the first extension table to support the first extension table from the main frame about the horizontal pivot axis.



82. An agricultural bale accumulator according to claim 72 wherein the first extension table support system further comprises:

a fourth frame extension member having a proximal end and a distal end; and

a frame attachment mechanism connected to the proximal end of the fourth frame extension member and the main frame to permit the distal end of the fourth frame extension member to be moveable relative to the main frame between a stowed position and an unstowed position, wherein the distal end of the fourth frame extension member moves towards the main frame when the fourth frame extension member is in the stowed position, wherein the distal end of the fourth frame extension member moves away from the main frame to a position on the horizontal pivot axis when the fourth frame extension member is in the unstowed position, wherein the distal end of the fourth frame extension member contacts the first extension table at the position on the horizontal pivot axis to support the first extension table from the main frame about the horizontal pivot axis when the fourth frame extension member is in the unstowed position.

83. An agricultural bale accumulator according to claim 82 wherein the frame attachment mechanism further comprises:

a pivoting mechanism for pivotally connecting the proximal end of the fourth frame extension member to the main frame about a vertical axis relative to the main frame.

84. An agricultural bale accumulator according to claim 82 wherein the frame attachment mechanism further comprises:

a telescoping mechanism for telescopically connecting the proximal end of the fourth frame extension member to the main frame along a horizontal axis relative to the main frame.

85. An agricultural bale accumulator according to claim 82 wherein the first extension table support system further comprises:

a first support wheel connected to the distal end of the fourth frame extension member and moveable with the fourth frame extension member when the fourth frame extension member moves between the stowed position and the unstowed position, wherein the first support wheel contacts the ground surface to support the first extension table from the ground surface when the fourth frame extension member is in the unstowed position.

86. An agricultural bale accumulator according to claim 85:

wherein the first support wheel provides a sole support a first side of the base module from the ground surface to permit the agricultural bale accumulator to be transported across the ground surface when the first extension table is in the stowed position and when the fourth frame extension member is in the stowed position, and wherein the first support wheel provides the sole support the first side of the base module and the first extension table from the ground surface to

permit the agricultural bale accumulator to be transported across the ground surface when the fourth frame extension member is in the unstowed position.

87. An agricultural bale accumulator according to claim 85 further comprising:

- 5 a first wheel and a second wheel coupled to the main frame, wherein the first wheel and the second wheel contact the ground surface to support the base module from the ground surface and to permit the agricultural bale accumulator to be transported across the ground surface, wherein the first support wheel contacts the ground surface to support the first extension table from the ground surface when the first extension table is in the unstowed position, when the  
10 fourth frame extension member is in the unstowed position and when the at least a portion of the load bed moves between the bale accumulating position and the bale discharging position, and wherein the first wheel, the second wheel and the first support wheel share a common axis of rotation when the fourth frame extension member is in at least the unstowed position.

15 88. An agricultural bale accumulator according to claim 55:

wherein a first part of the first extension table support system supports the first extension table at a location between a front side of the load bed where the plurality of bales are received on the load bed and the horizontal pivot axis when the first extension table is in the unstowed position and when the at least a portion of the load bed is in the bale accumulating position, and

- 20 wherein a second part of the first extension table support system supports the first extension table about the horizontal pivot axis when the first extension table is in the unstowed position and when the at least a portion of the load bed is moves between the bale accumulating position and the bale discharging position.

25 89. An agricultural bale accumulator according to claim 88 wherein at least one of the first part of the first extension table support system and the second part of the first extension table support system further comprises:

- a first support wheel connected to the first extension table and moveable with the first extension table when the first extension table moves between the stowed position and the  
30 unstowed position, wherein the first support wheel contacts the ground surface to support the first extension table from the ground surface.

90. An agricultural bale accumulator according to claim 89 further comprising:

- 35 a first wheel and a second wheel coupled to the main frame, wherein the first wheel and the second wheel contact the ground surface to support the base module from the ground surface and to permit the agricultural bale accumulator to be transported across the ground surface, and wherein the first wheel, the second wheel and the first support wheel share a common axis of rotation.

91. An agricultural bale accumulator according to claim 88 wherein at least one of the first part of the first extension table support system and the second part of the first extension table support system further comprises:

5 a first frame extension member connected to the first extension table and moveable with the first extension table when the first extension table moves between the stowed position and the unstowed position, wherein an end surface of the first frame extension member contacts an end surface of the base module to support the first extension table from the base module.

92. An agricultural bale accumulator according to claim 91:

10 wherein the end surface the first frame extension member has a downward angle relative to a horizontal axis when the first extension table is in the unstowed position,

wherein the end surface on the base module has an upward angle relative to the horizontal axis which is complementary to the downward angle, and

15 wherein the end surface the first frame extension member contacts the end surface on the base module to translate an upward force through the first frame extension member to support the first extension table from the base module.

93. An agricultural bale accumulator according to claim 88 wherein at least one of the first part of the first extension table support system and the second part of the first extension table support system further comprises:

20 a second frame extension member having a first end connected to the base module and a second end connected to the first extension table and being moveable between a collapsed position and an expanded position, wherein the second frame extension member is in the collapsed position when the first extension table is in the unstowed position, wherein the second frame extension member is in the expanded position when the first extension table is in the stowed position, and wherein the second frame extension member is connected to the first extension table and the base module to support the first extension table from the base module.

94. An agricultural bale accumulator according to claim 93 wherein the second frame extension member further comprises:

30 a first hydraulic cylinder for moving the first extension table between the stowed position and the unstowed position responsive to receiving pressurized hydraulic fluid from a hydraulic fluid source.

95. An agricultural bale accumulator according to claim 94 further comprising:

35 a second hydraulic fluid cylinder having a first end connected to the main frame and a second end connected to the at least a portion of the load bed, wherein the second cylinder moves the at least a portion of the load bed relative to the main frame between the bale accumulating position and the bale discharging position responsive to receiving pressurized hydraulic fluid from the hydraulic fluid source; and

40

a hydraulic valve for selectively routing the pressurized hydraulic fluid from the hydraulic fluid source to one of the first hydraulic cylinder and the second hydraulic cylinder responsive to an electric control signal.

5 96. An agricultural bale accumulator according to claim 93 wherein the second frame extension member further comprises:

at least one spring member, connected to at least one of the base module, the first extension table and the second frame extension member, for exerting a bias force on the first extension table when the first extension table is moved to at least one of the stowed position and  
10 the unstowed position.

97. An agricultural bale accumulator according to claim 88 wherein at least one of the first part of the first extension table support system and the second part of the first extension table support system further comprises:

15 a third frame extension member having a proximal end and a distal end, wherein the proximal end of the third frame extension member is connected to the main frame, wherein a distal end of the third frame extension member extends beyond the main frame in a direction transverse to a traveling direction of the agricultural bale accumulator at a fixed position which is located inside a road travel width dimension of the agricultural bale accumulator to permit safe traveling of  
20 the agricultural bale accumulator on a public roadway when the first extension table is in the stowed position, and

wherein a first portion of the first extension table is positioned inside the distal end of the third frame extension member and a second portion of the first extension table is positioned outside the distal end of the third frame extension member when the first extension table is in the  
25 unstowed position to permit the third frame extension member to contact the first extension table between the first portion of the first extension table and the second portion of the first extension table to support the first extension table from the main frame.

98. An agricultural bale accumulator according to claim 88 wherein at least one of the first part  
30 of the first extension table support system and the second part of the first extension table support system further comprises:

a fourth frame extension member having a proximal end and a distal end; and

a frame attachment mechanism connected to the proximal end of the fourth frame extension member and the main frame to permit the distal end of the fourth frame extension member to be  
35 moveable relative to the main frame between a stowed position and an unstowed position, wherein the distal end of the fourth frame extension member moves towards the main frame when the fourth frame extension member is in the stowed position, wherein the distal end of the fourth frame extension member moves away from the main frame when the fourth frame extension member is in the unstowed position, wherein the distal end of the fourth frame extension member

contacts the first extension table to support the first extension table from the main frame when the fourth frame extension member is in the unstowed position.

99. An agricultural bale accumulator according to claim 98 wherein the frame attachment mechanism further comprises:

a pivoting mechanism for pivotally connecting the proximal end of the fourth frame extension member to the main frame about a vertical axis relative to the main frame.

100. An agricultural bale accumulator according to claim 98 wherein the frame attachment mechanism further comprises:

a telescoping mechanism for telescopically connecting the proximal end of the fourth frame extension member to the main frame along a horizontal axis relative to the main frame.

101. An agricultural bale accumulator according to claim 98 wherein the first extension table support system further comprises:

a first support wheel connected to the distal end of the fourth frame extension member and moveable with the fourth frame extension member when the fourth frame extension member moves between the stowed position and the unstowed position, wherein the first support wheel contacts the ground surface to support the first extension table from the ground surface when the fourth frame extension member is in the unstowed position.

102. An agricultural bale accumulator according to claim 101:

wherein the first support wheel provides a sole support for a first side of the base module from the ground surface to permit the agricultural bale accumulator to be transported across the ground surface when the first extension table is in the stowed position and when the fourth frame extension member is in the stowed position, and wherein the first support wheel provides the sole support for the first side of the base module and the first extension table from the ground surface to permit the agricultural bale accumulator to be transported across the ground surface when the first extension table is the unstowed position and when the first extension table is in the unstowed position and when the fourth frame extension member is in the unstowed position.

103. An agricultural bale accumulator according to claim 101 further comprising:

a first wheel and a second wheel coupled to the main frame, wherein the first wheel and the second wheel contact the ground surface to support the base module from the ground surface and to permit the agricultural bale accumulator to be transported across the ground surface when the first extension table is in the stowed position and the unstowed position and when the fourth frame extension member is in the stowed position and the unstowed position, wherein the first support wheel contacts the ground surface to support the first extension table from the ground surface when the first extension table is the unstowed position and when the fourth frame extension member is in the unstowed position, and wherein the first wheel, the second wheel and

the first support wheel share a common axis of rotation when the fourth frame extension member is in at least the unstowed position.

104. An agricultural bale accumulator according to claim 55 further comprising:

a third extension table which is substantially planar; and

a third hinge for pivotally connecting the third extension table to the first extension table to permit the third extension table to be moveable with the first extension table relative to the base module when the first extension table moves between the stowed position and the unstowed position, wherein the third extension table is moveable between a stowed position and an unstowed position relative to the first extension table, wherein the third extension table is substantially co-planar with the load bed and the first extension table and adjacent to the first extension table when each of the first extension table and the third extension table are in the unstowed position to permit the third extension table to accumulate thereon at least one of the plurality of bales when the at least a portion of the load bed is in the bale accumulating position.

105. An agricultural bale accumulator according to claim 104 further comprising:

a third extension table support system connected to at least one of the base module, the first extension table and the third extension table, wherein the third extension table support system contacts the third extension table at a location beyond the first extension table and contacts at least one of the base module, the first extension table and the ground surface to support the third extension table from at least one of the base module, the first extension table and the ground surface, respectively, when each of the first extension table and the third extension table are in the unstowed position and when the at least a portion of the load bed is moves between the bale accumulating position and the bale discharging position.

106. An agricultural bale accumulator according to claim 105:

wherein the third extension table support system supports the third extension table at a location between a front side of the load bed where the plurality of bales are received on the load bed and the horizontal pivot axis when each of the first extension table and the third extension table are in the unstowed position and when the at least a portion of the load bed is in the bale accumulating position, and

wherein the third extension table support system supports the third extension table about the horizontal pivot axis when each of the first extension table and the third extension table are in the unstowed position and when the at least a portion of the load bed moves between the bale accumulating position and the bale discharging position.

107. An agricultural bale accumulator according to claim 106 wherein the third extension table support system further comprises:

a first support wheel connected to the third extension table and moveable with the third extension table when the third extension table moves between the stowed position and the

unstowed position, wherein the first support wheel contacts the ground surface to support the third extension table from the ground surface.

108. An agricultural bale accumulator according to claim 107 further comprising:

a first wheel and a second wheel coupled to the main frame, wherein the first wheel and the second wheel contact the ground surface to support the base module from the ground surface and to permit the agricultural bale accumulator to be transported across the ground surface, and wherein the first wheel, the second wheel and the first support wheel share a common axis of rotation.

109. An agricultural bale accumulator according to claim 106 wherein the third extension table support system further comprises:

a first frame extension member connected to the third extension table and moveable with the third extension table when the third extension table moves between the stowed position and the unstowed position, wherein an end surface of the first frame extension member contacts an end surface of at least one of the base module and the first extension table to support the third extension table from at least one of the base module and the first extension table.

110. An agricultural bale accumulator according to claim 109:

wherein the end surface the first frame extension member has a downward angle relative to a horizontal axis when the first extension table is in the unstowed position,

wherein the end surface on at least one of the base module and the first extension table has an upward angle relative to the horizontal axis which is complementary to the downward angle, and

wherein the end surface the first frame extension member contacts the end surface on at least one of the base module and the first extension table to translate an upward force through the first frame extension member to support the third extension table from at least one of the base module and the first extension table.

111. An agricultural bale accumulator according to claim 106 wherein the third extension table support system further comprises:

a second frame extension member having a first end connected to at least one of the base module and the first extension table and a second end connected to the third extension table and being moveable between a collapsed position and an expanded position, wherein the second frame extension member is in the collapsed position when the third extension table is in the unstowed position, wherein the second frame extension member is in the expanded position when the third extension table is in the stowed position, and wherein the second frame extension member is connected to the third extension table and at least one of the base module and the first extension table to support the first extension table from at least one of the base module and the first extension table.

112. An agricultural bale accumulator according to claim 111 wherein the second frame extension member further comprises:

a first hydraulic cylinder for moving the third extension table between the stowed position and the unstowed position responsive to receiving pressurized hydraulic fluid from a hydraulic fluid source.

113. An agricultural bale accumulator according to claim 112 further comprising:

a second hydraulic fluid cylinder having a first end connected to the main frame and a second end connected to the at least a portion of the load bed, wherein the second cylinder moves the at least a portion of the load bed relative to the main frame between the bale accumulating position and the bale discharging position responsive to receiving pressurized hydraulic fluid from the hydraulic fluid source; and

a hydraulic valve for selectively routing the pressurized hydraulic fluid from the hydraulic fluid source to one of the first hydraulic cylinder and the second hydraulic cylinder responsive to an electric control signal.

114. An agricultural bale accumulator according to claim 111 wherein the second frame extension member further comprises:

at least one spring member, connected to at least one of the base module, the first extension table, the third table, and the second frame extension member, for exerting a bias force on the third extension table when the third extension table is moved to at least one of the stowed position and the unstowed position.

115. An agricultural bale accumulator according to claim 106 wherein the third extension table support system further comprises:

a third frame extension member having a proximal end and a distal end, wherein the proximal end of the third frame extension member is connected to the main frame, wherein a distal end of the third frame extension member extends beyond the main frame in a direction transverse to a traveling direction of the agricultural bale accumulator at a fixed position which is located inside a road travel width dimension of the agricultural bale accumulator to permit safe traveling of the agricultural bale accumulator on a public roadway when each of the first extension table and the third extension table are in the unstowed position, and

wherein a first portion of the third extension table is positioned inside the distal end of the third frame extension member and a second portion of the third extension table is positioned outside the distal end of the third frame extension member when the third extension table is in the unstowed position to permit the third frame extension member to contact the third extension table between the first portion of the third extension table and the second portion of the third extension table to support the third extension table from the main frame.



116. An agricultural bale accumulator according to claim 106 wherein the third extension table support system further comprises:

a fourth frame extension member having a proximal end and a distal end; and

a frame attachment mechanism connected to the proximal end of the fourth frame extension member and the main frame to permit the distal end of the fourth frame extension member to be moveable relative to the main frame between a stowed position and an unstowed position, wherein the distal end of the fourth frame extension member moves towards the main frame when the fourth frame extension member is in the stowed position, wherein the distal end of the fourth frame extension member moves away from the main frame when the fourth frame extension member is in the unstowed position, wherein the distal end of the fourth frame extension member contacts the third extension table to support the third extension table from the main frame when the fourth frame extension member is in the unstowed position.

117. An agricultural bale accumulator according to claim 116 wherein the frame attachment mechanism further comprises:

a pivoting mechanism for pivotally connecting the proximal end of the fourth frame extension member to the main frame about a vertical axis relative to the main frame.

118. An agricultural bale accumulator according to claim 116 wherein the frame attachment mechanism further comprises:

a telescoping mechanism for telescopically connecting the proximal end of the fourth frame extension member to the main frame along a horizontal axis relative to the main frame.

119. An agricultural bale accumulator according to claim 116 wherein the third extension table support system further comprises:

a first support wheel connected to the distal end of the fourth frame extension member and moveable with the fourth frame extension member when the fourth frame extension member moves between the stowed position and the unstowed position, wherein the first support wheel contacts the ground surface to support the third extension table from the ground surface when the fourth frame extension member is in the unstowed position.

120. An agricultural bale accumulator according to claim 119:

wherein the first support wheel provides a sole support for a first side of the base module from the ground surface to permit the agricultural bale accumulator to be transported across the ground surface when the third extension table is in the stowed position and when the fourth frame extension member is in the stowed position, and wherein the first support wheel provides the sole support for the first side of the base module and the first extension table from the ground surface to permit the agricultural bale accumulator to be transported across the ground surface when the

first extension table is in the unstowed position, when the third extension table is the unstowed position and when the fourth frame extension member is in the unstowed position.

121. An agricultural bale accumulator according to claim 119 further comprising:

5 a first wheel and a second wheel coupled to the main frame, wherein the first wheel and the second wheel contact the ground surface to support the base module from the ground surface and to permit the agricultural bale accumulator to be transported across the ground surface when each of the first extension table and the third extension table are in the stowed position and the unstowed position and when the fourth frame extension member is in the stowed position and the  
10 unstowed position, wherein the first support wheel contacts the ground surface to support the third extension table from the ground surface when each of the first extension table and the third extension table are in the unstowed position and when the fourth frame extension member is in the unstowed position, and wherein the first wheel, the second wheel and the first support wheel share a common axis of rotation when the fourth frame extension member is in at least the  
15 unstowed position.

122. An agricultural bale accumulator according to claim 104:

wherein the first extension table pivots upwards towards the base module about the first hinge axis when the first extension table is in the stowed position, and

20 wherein the third extension table pivots upwards towards the base module and the first extension table about the third hinge axis when the third extension table is in the stowed position.

123. An agricultural bale accumulator according to claim 104:

wherein the first extension table pivots upwards towards the base module about the first  
25 hinge axis when the first extension table is in the stowed position, and

wherein the third extension table pivots downwards towards the base module and the first extension table about the third hinge axis when the third extension table is in the stowed position.

124. An agricultural bale accumulator according to claim 55 further comprising:

30 an alignment mechanism for aligning the at least a portion of the load bed with the main frame when the at least a portion of the load bed is in the bale accumulating position.

125. An agricultural bale accumulator according to claim 55 further comprising:

35 a latch mechanism for latching the at least a portion of the load bed to the main frame when the at least a portion of the load bed is in the bale accumulating position and for unlatching the at least a portion of the load bed from the main frame when the at least a portion of the load bed is in the bale discharging position.

126. An agricultural bale accumulator according to claim 55 wherein the load bed extension  
40 module further comprising:

a second extension table which is substantially planar;

a second extension table attachment mechanism connected to the second extension table and the base module to permit the second extension table to be moveable relative to the base module between a stowed position and an unstowed position, wherein the second extension table is substantially co-planar with the load bed and adjacent to a second side of the load bed when the second extension table is in the unstowed position to permit the second extension table to accumulate thereon at least one of the plurality of bales; and

a second extension table support system connected to at least one of the base module and the second extension table, wherein the second extension table support system contacts the second extension table at a location beyond the second side of the load bed and contacts at least one of the base module and the ground surface to support the second extension table from at least one of the base module and the ground surface, respectively, when the second extension table is in the unstowed position and when the at least a portion of the load bed moves between the bale accumulating position and the bale discharging position.

127. An agricultural bale accumulator according to claim 55 wherein the load bed extension module is attachable to and detachable from the base module independently of any other module on the agricultural bale accumulator.

128. An agricultural bale accumulator according to claim 55 further comprising:  
a first bale position sensor for sensing that at least one of the plurality of bales is disposed on the first extension table.

129. An agricultural bale accumulator comprising:

a base module including:

a load bed which is substantially planar for receiving a plurality of bales to accumulate thereon the plurality of bales; and

a main frame for supporting the load bed above a ground surface;

a bale discharge module including at least a portion of the load bed pivotally connected to the main frame about a pivot point disposed on a horizontal pivot axis and moveable relative to the main frame between a bale accumulating position and a bale discharging position, wherein the at least a portion of the load bed is in a horizontal position relative to the main frame when the at least a portion of the load bed is in the bale accumulating position to permit the at least a portion of the load bed to accumulate thereon the plurality of bales, and wherein the at least a portion of the load bed is in an inclined position relative to the main frame when the load bed is in the bale discharging position to permit the at least a portion of the load bed to discharge the plurality of bales accumulated thereon to the ground surface;

a load bed extension module including:

a first extension table which is substantially planar;

a first hinge for pivotally connecting the first extension table to the at least a portion of the load bed about a first hinge axis to permit the first extension table to be moveable relative to the at least a portion of the load bed between a stowed position and an unstowed position and to permit the first extension table to be moveable with the at least a portion of the load bed when the at least a portion of the load bed moves between the bale accumulating position and the bale discharging position, wherein the first extension table is substantially co-planar with the at least a portion of the load bed and adjacent to a first side of the at least a portion of the load bed when the first extension table is in the unstowed position to permit the first extension table to accumulate thereon at least one of the plurality of bales when the at least a portion of the load bed is in the bale accumulating position; and

a first extension table support system connected to at least one of the base module and the first extension table, wherein the first extension table support system contacts the first extension table at a location beyond the first side of the load bed and contacts at least one of the base module and the ground surface to support the first extension table from at least one of the base module and the ground surface, respectively, when the first extension table is in the unstowed position and when the at least a portion of the load bed is in at least one of the bale accumulating position and the bale discharging position,

wherein a first part of the first extension table support system supports the first extension table at a location between a front side of the load bed where the plurality of bales are received on the load bed and the horizontal pivot axis when the first extension table is in the unstowed position and when the at least a portion of the load bed is in the bale accumulating position, and

wherein a second part of the first extension table support system supports the first extension table about the horizontal pivot axis when the first extension table is in the unstowed position and when the at least a portion of the load bed is moves between the bale accumulating position and the bale discharging position;

a third extension table which is substantially planar;

a third hinge for pivotally connecting the third extension table to the first extension table to permit the third extension table to be moveable with the first extension table relative to the base module when the first extension table moves between the stowed position and the unstowed position, wherein the third extension table is moveable between a stowed position and an unstowed position relative to the first extension table, wherein the third extension table is substantially co-planar with the load bed and the first extension table and adjacent to the first extension table when each of the first extension table and the third extension table are in the unstowed position to permit the third extension table to accumulate thereon at least one of the plurality of bales when the at least a portion of the load bed is in the bale accumulating position; and

a third extension table support system connected to at least one of the base module, the first extension table and the third extension table, wherein the third extension table support system contacts the third extension table at a location beyond the first extension table and contacts

at least one of the base module, the first extension table and the ground surface to support the third extension table from at least one of the base module, the first extension table and the ground surface, respectively, when each of the first extension table and the third extension table are in the unstowed position and when the at least a portion of the load bed is in at least one of the bale accumulating position and the bale discharging position,

wherein a first part of the third extension table support system supports the third extension table at a location between a front side of the load bed where the plurality of bales are received on the load bed and the horizontal pivot axis when each of the first extension table and the third extension table are in the unstowed position and when the at least a portion of the load bed is in the bale accumulating position, and

wherein a second part of the third extension table support system supports the third extension table about the horizontal pivot axis when each of the first extension table and the third extension table are in the unstowed position and when the at least a portion of the load bed is moves between the bale accumulating position and the bale discharging position; and

a bale transfer module operable to distribute the plurality of bales received on the load bed across the load bed, the first extension table and the third extension table to accumulate the plurality of bales on the load bed, the first extension table and the third extension table when each of the first extension table and the third extension table are in the unstowed position and when the at least a portion of the load bed is in the bale accumulating position.

## Bale Stacking Module

### Stacking Apparatus

1. An agricultural bale accumulator comprising:

a load bed which is substantially planar for receiving thereon a plurality of bales including at least a first bale and a second bale at a first position along a first axis;

a bale-stacking module for stacking the first bale and the second bale along a third axis which is vertically transverse to the first axis responsive to the step of receiving to form a stack of bales on the load bed at the first position along the first axis; and

a bale-transfer module for transferring the stack of bales across the load bed along a second axis horizontally transverse to the first axis and the third axis to form a plurality of stacks of bales on the load bed.

2. An agricultural bale accumulator according to claim 1 further comprising:

a bale-discharge module for discharging the plurality of stacks of bales on the load bed to a ground surface.

3. An agricultural bale accumulator according to claim 1 wherein the bale-stacking module further comprises:

a portion of the load bed;

a cylinder for moving the portion of the load bed between a first position and a second position, the portion of the load bed being planar with the load bed for receiving the first bale when the portion of the load bed is in the first position, the portion of the load bed being lower than the load bed when the portion of the load bed is in the second position;

wherein the cylinder moves the portion of the load bed to the second position after the portion of the load bed receives the first bale, wherein the second bale is received above the first bale, wherein the first bale and the second bale form a stack of bales, wherein the first portion of the load bed is moved back to the first position to position the stack of bales planar with the load bed.

4. An agricultural bale accumulator according to claim 2 wherein the bale-lowering module further comprises:

a portion of the load bed.

5. An agricultural bale accumulator according to claim 1 wherein the bale-stacking module further comprises:

a bale-raising module for moving at least one bale between a first position and a second position along the third axis, wherein the at least one bale is located on the load bed at the first position along the first axis when in the at least one bale is located in first position along the third axis, and wherein the at least one bale is located above the first position along the first axis on the load bed when the at least one bale is located in the second position along the third axis;

wherein the first portion of the load bed receives the first bale when the first portion of the load bed is in the first position, wherein the first portion of the load bed moves to the second position below the load bed after receiving the first bale, wherein the second bale is received above the first bale, wherein the first bale and the second bale form a stack of bales, wherein the first portion of the load bed is moved back to the first position to position the stack of bales planar with the load bed.

6. An agricultural bale accumulator according to claim 1 wherein the bale stacker further comprises:

a structure permanently above the load bed

7. An agricultural bale accumulator according to claim 1 wherein the bale stacker further comprises:

a bale locator for locating a predetermined position of each of the plurality of bales received on the load bed along a bale receiving path at a first rate of speed in the first axis; and

a bale advancement module for advancing the receipt of the first bale onto the load bed responsive to the first bale being located at the predetermined position on the bale receiving path,

the first bale being advanced at a second rate or speed, greater than the first rate of speed, along the bale receiving path to separate the first bale from the second bale by a predetermined distance;

wherein the bale stacker forms the stack of bales in an amount of time less than the time it takes the second bale to move through the predetermined distance at the first rate of speed.

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#### Bale Stacking - Two Tables

1. An agricultural bale accumulator comprising:  
a first load bed; and  
a second load bed;

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wherein first load bed receives thereon a first plurality of bales along a first axis, the first load bed being moveable relative to the second load bed, along a second axis vertically traverse to the first axis, between a first position and a second position, the first load bed being horizontal with the second load bed when the second load bed is in the first position and when the first load bed is in the second position, the first load bed is disposed in the same plane as or above the second load bed when the first load bed is in the first position, the first load bed is disposed above the first load bed when the first load bed is in the second position; and

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wherein second load bed receives thereon a second plurality of bales along the first axis when the second load bed is in the second position.

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2. An agricultural bale accumulator according to claim 1 further comprising:  
a bale discharge module for discharging at least one of the first plurality of bales on the first load bed and the second plurality of bales on the second load bed to the ground.

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3. An agricultural bale accumulator according to claim 2 wherein the first load bed is moved back to the first position responsive to at least the second plurality of bales being discharged to the ground.

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4. An agricultural bale accumulator according to claim 2 wherein the first plurality of bales and the second plurality of bales are discharged at the same time causing the first plurality of bales to be disposed directly on top of the second plurality of bales to form a stack of plurality of bales on the ground.

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5. An agricultural bale accumulator according to claim 2 wherein the first plurality of bales and the second plurality of bales are discharged at different times causing the first plurality of bales to be disposed next to the second plurality of bales to form a single layer of plurality of bales on the ground.

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6. An agricultural bale accumulator according to claim 1 further comprising:  
a bale-transfer module for transferring the first plurality of bales across the first load bed, along a third axis horizontally traverse to the first axis, to position the first plurality of bales in a

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side-by-side relationship on the first load bed responsive to receiving the first plurality of bales on the first load bed.

7. An agricultural bale accumulator according to claim 1 further comprising:

5 a bale-transfer module for transferring the second plurality of bales across the second load bed, along a third axis horizontally traverse to the first axis, to position the second plurality of bales in a side-by-side relationship on the second load bed responsive to receiving the second plurality of bales on the second load bed.

10 8. An agricultural bale accumulator according to claim 1 wherein the first load bed and the second load bed are disposed in the same plane when the first load bed is in the first position.

9. A method for operating an agricultural bale accumulator according to claim 1 wherein the first load bed and the second load bed are disposed in different parallel planes when the first load  
15 bed is in the first position.

22. A method for operating an agricultural bale accumulator according to claim 19 wherein a portion the first load bed and a portion the second load bed are both disposed in a common plane substantially parallel to the first axis and the second axis and substantially perpendicular to the  
20 third axis to permit the portion of the first load bed to interleave with the portion of the second load bed in the common plane when the first load bed and the second load bed are each located at the first position on the third axis.

23. A method for operating an agricultural bale accumulator according to claim 19 wherein the  
25 first load bed and the second load bed are disposed in different planes substantially parallel to the first axis and the second axis and substantially perpendicular to the third axis to permit the first load bed to be disposed on top of the second load bed when the first load bed is located at the first position on the third axis.

27. A method for operating an agricultural bale accumulator according to claim 24 wherein a  
30 portion of the substantially planar bale receiving surface of the first load bed and a portion of the substantially planar bale receiving surface of the second load bed are both disposed in a common plane substantially parallel to the first axis and the second axis and substantially perpendicular to the third axis to permit the portion of the substantially planar bale receiving surface of the first load  
35 bed to interleave with the portion of the substantially planar bale receiving surface of the second load bed in the common plane when the substantially planar bale receiving surface of the first load bed and the substantially planar bale receiving surface of the second load bed are each located at the first position on the third axis.



28. A method for operating an agricultural bale accumulator according to claim 24 wherein the substantially planar bale receiving surface of the first load bed and the substantially planar bale receiving surface of the second load bed are disposed in different planes substantially parallel to the first axis and the second axis and substantially perpendicular to the third axis to permit the substantially planar bale receiving surface of the first load bed to be disposed on top of the substantially planar bale receiving surface of the second load bed when the substantially planar bale receiving surface of the first load bed is located at the first position on the third axis.

Stacking - Method:

130. A method for operating an agricultural bale accumulator, the method comprising the steps of:

receiving a plurality of bales on a load bed along a first axis;

forming a first layer bales on the load bed along a second axis which is horizontally transverse to the first axis and along a third axis which is vertically transverse to the first axis and the second axis responsive to the step of receiving, wherein the first layer of bales includes at least two bales disposed in a first common plane which is substantially parallel with the first axis and the second axis and substantially perpendicular to the third axis; and

forming a second layer of bales on the load bed along the second axis and along the third axis responsive to the step of receiving, wherein the second layer of bales includes at least two bales disposed in a second common plane which is substantially parallel with the first axis and the second axis, substantially perpendicular to the third axis, and vertically displaced with respect to the first common plane along the third axis.

131. A method for operating an agricultural bale accumulator according to claim 130 wherein the agricultural bale accumulator is supported by a ground surface and wherein the method further comprises the steps of:

discharging the first layer of bales on the load bed to the ground surface; and

discharging the second layer of bales on the load bed to the ground surface responsive to the step of discharging the first layer of bales.

132. A method for operating an agricultural bale accumulator according to claim 130 wherein the agricultural bale accumulator is supported by a ground surface and wherein the method further comprises the steps of:

discharging the first layer of bales on the load bed to the ground surface; and

discharging the second layer of bales on the load bed to a top surface of the first layer of bales responsive to the step of discharging the first layer of bales.

133. A method for operating an agricultural bale accumulator according to claim 130:

wherein the step of receiving further comprises the step of:

receiving at least a first bale, a second bale, a third bale and a fourth bale of the plurality of bales on the load bed along the first axis; and

5 wherein the steps of forming the first layer of bales and the second layer of bales on the load bed further comprises the steps of:

stacking the first bale in direct contact with the second bale along the third axis responsive to the step of receiving the first bale and the second bale to form a first stack of bales on the load bed;

10 transferring the first stack of bales across the load bed along the second axis responsive to the step of stacking the first bale in direct contact with the second bale;

stacking the third bale in direct contact with the fourth bale along the third axis responsive to the step of receiving the third bale and the fourth bale to form a second stack of bales on the load bed; and

15 transferring the second stack of bales across the load bed along the second axis responsive to the step of stacking the third bale in direct contact with the fourth bale,

wherein the first bale of the first stack of bales and the third bale of the second stack of bales form the first layer of bales on the load bed, and

20 wherein the second bale of the first stack of bales and the fourth bale of the second stack of bales form the second layer of bales on the load bed.

134. A method for operating an agricultural bale accumulator according to claim 133 wherein the agricultural bale accumulator is supported by a ground surface and wherein the method further comprises the step of:

25 discharging the first stack of bales and the second stack of bales on the load bed to the ground surface.

135. A method for operating an agricultural bale accumulator according to claim 133:

wherein the step of receiving at least a first bale, a second bale, a third bale and a fourth bale further comprises the steps of:

30 receiving the first bale on the load bed at a first position on the first axis, at a first position on the second axis and at a first position on the third axis; and

receiving the second bale on the load bed at the first position on the first axis, at the first position on the second axis and at the first position on the third axis responsive to the step of receiving the first bale on the load bed;

35 receiving the third bale on the load bed at the first position on the first axis, at the first position on the second axis and at the first position on the third axis responsive to the step of receiving the second bale on the load bed; and

40 receiving the fourth bale on the load bed at the first position on the first axis, at the first position on the second axis and at the first position on the third axis responsive to the step of receiving the third bale on the load bed;

wherein the step of stacking the first bale in direct contact with the second bale further comprises the steps of:

moving the first bale to a second position on the third axis which is vertically displaced from the first position on the third axis responsive to the step of receiving the first bale on the load bed; and

moving at least one of the first bale and the second bale along the third axis responsive to the step of receiving the second bale on the load bed to form the first stack of bales on the load bed, wherein one of the first bale and the second bale provides a first support bale for the first stack of bales on the load bed and is located on the load bed at the first position on the first axis, at the first position on the second axis and at the first position on the third axis;

wherein the step of transferring the first stack of bales further comprises the step of:

transferring the first stack of bales across the load bed to a second position along the second axis responsive to the step of moving at least one of the first bale and the second bale;

wherein the step of stacking the third bale in direct contact with the fourth bale further comprises the steps of:

moving the third bale to a second position on the third axis which is vertically displaced from the first position on the third axis responsive to the step of receiving the third bale on the load bed; and

moving at least one of the third bale and the fourth bale along the third axis responsive to the step of receiving the fourth bale on the load bed to form the second stack of bales on the load bed, wherein one of the third bale and the fourth bale provides a second support bale for the second stack of bales on the load bed and is located on the load bed at the first position on the first axis, at the first position on the second axis and at the first position on the third axis; and

wherein the step of transferring the second stack of bales further comprises the step of:

transferring the second stack of bales across the load bed to one of the second position and a third position along the second axis responsive to the step of moving at least one of the third bale and the fourth bale.

136. A method for operating an agricultural bale accumulator according to claim 135 wherein the second position on the third axis is disposed above the first position on the third axis to permit the first bale to be positioned above the second bale so that the second bale provides the first support bale for the first stack of bales on the load bed and to permit the third bale to be positioned above the fourth bale so that the fourth bale provides the second support bale for the second stack of bales on the load bed.

137. A method for operating an agricultural bale accumulator according to claim 136: wherein the step of moving the first bale further comprises the step of:

raising the first bale to the second position on the third axis which is vertically displaced above the first position on the third axis responsive to the step of receiving the first bale on the load bed;

wherein the step of moving at least one of the first bale and the second bale further comprises the step of:

lowering the first bale to contact a top surface of the second bale along the third axis responsive to the step of receiving the second bale on the load bed to form the first stack of bales on the load bed;

wherein the step of moving the third bale further comprises the step of:

raising the third bale to the second position on the third axis which is vertically displaced above the first position on the third axis, responsive to the step of receiving the third bale on the load bed; and

wherein the step of moving at least one of the third bale and the fourth bale further comprises the step of:

lowering the third bale to contact a top surface of the fourth bale along the third axis responsive to the step of receiving the fourth bale on the load bed to form the second stack of bales on the load bed.

138. A method for operating an agricultural bale accumulator according to claim 135 wherein the second position on the third axis is disposed below the first position on the third axis to permit the first bale to be positioned below the second bale so that the first bale provides the first support bale for the first stack of bales on the load bed and to permit the third bale to be positioned below the fourth bale so that the third bale provides the second support bale for the second stack of bales on the load bed.

139. A method for operating an agricultural bale accumulator according to claim 138:

wherein the step of moving the first bale further comprises the step of:

lowering the first bale to the second position on the third axis which is vertically displaced below the first position on the third axis responsive to the step of receiving the first bale on the load bed;

wherein the step of moving at least one of the first bale and the second bale further comprises the step of:

raising the first bale to contact a bottom surface of the second bale along the third axis responsive to the step of receiving the second bale on the load bed to form the first stack of bales on the load bed;

wherein the step of moving the third bale further comprises the step of:

lowering the third bale to the second position on the third axis which is vertically displaced below the first position on the third axis, responsive to the step of receiving the third bale on the load bed; and

wherein the step of moving at least one of the third bale and the fourth bale further comprises the step of:

raising the third bale to contact a bottom surface of the fourth bale along the third axis responsive to the step of receiving the fourth bale on the load bed to form the second stack of bales on the load bed.

140. A method for operating an agricultural bale accumulator according to claim 130:

wherein the step of receiving further comprises the step of:

receiving at least a first bale, a second bale, a third bale and a fourth bale of the plurality of bales on the load bed along the first axis; and

wherein the steps of forming the first layer of bales and the second layer of bales on the load bed further comprises the steps of:

transferring the first bale and the second bale across the load bed along the second axis;

stacking the first bale in direct contact with the second bale on the load bed along the third axis responsive to the step of transferring the first bale and the second bale to form a first stack of bales on the load bed;

transferring the third bale and the fourth bale across the load bed along the second axis; and

stacking the third bale in direct contact with the fourth bale on the load bed along the third axis responsive to the step of transferring the third bale and the fourth bale to form a second stack of bales on the load bed,

wherein the first bale of the first stack of bales and the third bale of the second stack of bales form the first layer of bales on the load bed, and

wherein the second bale of the first stack of bales and the fourth bale of the second stack of bales form the second layer of bales on the load bed.

141. A method for operating an agricultural bale accumulator according to claim 130:

wherein the step of receiving the plurality of bales further comprises the step of:

receiving a first plurality of bales and a second plurality of bales on the load bed;

wherein the step of forming the first layer of bales further comprises the step of:

transferring a first plurality of bales across a first load bed on the load bed along the second axis responsive to the step of receiving the first plurality of bales to permit the first load bed to accumulate the first layer of bales; and

wherein the step of forming the second layer of bales further comprises the step of:

transferring a second plurality of bales across a second load bed on the load bed along the second axis, wherein the first load bed is vertically separated from the second load bed along the third axis by a predetermined distance at least equal to a predetermined height of each of the plurality of bales responsive to the step of receiving the second plurality of bales to accumulate the second layer of bales.

142. A method for operating an agricultural bale accumulator according to claim 141 wherein the first load bed is moveable with respect to the second load bed along the third axis between a first position on the third axis and a second position on the third axis located above the first position on the third axis.

143. A method for operating an agricultural bale accumulator according to claim 142: wherein the step of receiving the first plurality of bales further comprises the step of: receiving the first plurality of bales along the first axis on the first load bed disposed in the first position along the third axis;

wherein the step of forming the first layer of bales further comprises the step of: transferring the first plurality of bales across the first load bed along the second axis responsive to the step of receiving the first plurality of bales along the first axis on the first load bed to permit the first load bed to accumulate the first layer of bales; and

raising the first load bed with the first layer of bales disposed thereon to the second position on the third axis a predetermined distance above the first position on the third axis responsive to the step of transferring the first plurality of bales; and

wherein the step of receiving the second plurality of bales further comprises the step of: receiving the second plurality of bales along the first axis on the second load bed which is disposed in the first position along the third axis below the first load bed responsive to the step of raising; and

wherein the step of forming the second layer of bales further comprises the step of: transferring the second plurality of bales across the second load bed along the second axis responsive to the step of receiving the second plurality of bales along the first axis on the second load bed to permit the second load bed to accumulate the second layer of bales.

144. A method for operating an agricultural bale accumulator according to claim 143 wherein the agricultural bale accumulator is supported by a ground surface and wherein the method further comprises the steps of:

discharging the second layer of bales on the second load bed to the ground surface; and discharging the first layer of bales on the first load bed to the ground surface responsive to the step of discharging the first layer of bales.

145. A method for operating an agricultural bale accumulator according to claim 144 further comprising the step of:

lowering the first load bed to the first position along the third axis responsive to the step of discharging the second layer of bales,

wherein the step of discharging the first layer of bales on the first load bed to the ground surface occurs responsive to the step of lowering the first load bed.

146. A method for operating an agricultural bale accumulator according to claim 143 wherein the agricultural bale accumulator is supported by a ground surface and wherein the method further comprises the steps of:

5       discharging the second layer of bales on the second load bed to the ground surface; and  
      discharging the first layer of bales on the first load bed to a top surface of the second layer of bales responsive to the step of discharging the second layer of bales to form a plurality of stacks of bales on the ground surface.

10   147. A method for operating an agricultural bale accumulator according to claim 143 further comprising the step of:

      determining that the first load bed has accumulated a predetermined number of the first plurality of bales to form the first layer of bales responsive to the step of transferring the first plurality of bales,

15       wherein the step of raising the first load bed occurs responsive to the step of determining.

148. A method for operating an agricultural bale accumulator according to claim 141 wherein the first load bed is located at a fixed position above the second load bed along the third axis.

20   149. A method for operating an agricultural bale accumulator according to claim 148:

      wherein the step of receiving the first plurality of bales further comprises the step of:

          receiving the first plurality of bales on the second load bed;

      wherein the step of forming the first layer of bales further comprises the step of:

25       raising each of the first plurality of bales received on the second load bed above the second load bed to a location along the third axis so that a bottom surface of each of the first plurality of bales is substantially coplanar with a bale receiving surface of the first load bed responsive to the step of receiving the first plurality of bales on the second load bed;

      transferring each of the first plurality of bales across the first load bed along the second axis responsive to the step of raising to permit the first load bed to accumulate the first layer of bales;

30       wherein the step of receiving the second plurality of bales further comprises the step of:

      receiving the second plurality of bales on the second load bed responsive to receiving the first plurality of bales; and

      wherein the step of forming the second layer of bales further comprises the step of:

35       transferring the second plurality of bales across the second load bed along the second axis responsive to the step of receiving the second plurality of bales on the second load bed to permit the second load bed to accumulate the second layer of bales.

150. A method for operating an agricultural bale accumulator according to claim 149 wherein the agricultural bale accumulator is supported by a ground surface and wherein the method further comprises the steps of:

discharging the second layer of bales on the second load bed to the ground surface; and  
5 discharging the first layer of bales on the first load bed to the ground surface responsive to the step of discharging the first layer of bales.

151. A method for operating an agricultural bale accumulator according to claim 149 wherein the agricultural bale accumulator is supported by a ground surface and wherein the method further  
10 comprises the steps of:

discharging the second layer of bales on the second load bed to the ground surface; and  
discharging the first layer of bales on the first load bed to a top surface of the second layer  
of bales responsive to the step of discharging the second layer of bales to form a plurality of  
stacks of bales on the ground surface.

152. A method for operating an agricultural bale accumulator according to claim 148 further  
comprising the step of:

determining that the first load bed has accumulated a predetermined number of the first  
plurality of bales to form the first layer of bales responsive to the step of transferring the first  
20 plurality of bales,

wherein the step of receiving the second plurality of bales on the second load bed occurs  
responsive to the step of determining.

#### Bale Stacking Module:

1. A method for operating an agricultural bale accumulator comprising the steps of:  
receiving at least a first bale and a second bale on a substantially planar bale receiving  
surface of a load bed along a first axis;  
stacking the first bale in direct contact with the second bale along a third axis which is  
vertically transverse to the first axis responsive to the step of receiving to form at least one stack of  
30 bales on the substantially planar bale receiving surface of the load bed; and  
transferring the at least one stack of bales across the substantially planar bale receiving  
surface of the load bed along a second axis which is horizontally transverse to the first axis and  
the third axis responsive to the step of stacking.

2. A method for operating an agricultural bale accumulator according to claim 1 wherein the  
agricultural bale accumulator is supported by a ground surface and wherein the method further  
comprises the step of:

discharging the at least one stack of bales on the substantially planar bale receiving surface  
of the load bed to the ground surface.



3. A method for operating an agricultural bale accumulator according to claim 1:  
wherein the step of receiving further comprises the steps of:

receiving the first bale on the substantially planar bale receiving surface of the load  
5 bed at first position on the first axis, at a first position on the second axis and at a first position on  
the third axis; and

receiving the second bale on the substantially planar bale receiving surface of the  
load bed at the first position on the first axis, at the first position on the second axis and at the first  
position on the third axis responsive to the step of receiving the first bale;

10 wherein the step of stacking further comprises the steps of:

moving the first bale to a second position on the third axis which is vertically  
displaced from the first position on the third axis responsive to the step of receiving the first bale  
on the substantially planar bale receiving surface of the load bed; and

moving at least one of the first bale and the second bale along the third axis  
15 responsive to the step of receiving the second bale on the substantially planar bale receiving  
surface of the load bed to form the at least one stack of bales on the substantially planar bale receiving  
surface of the load bed, wherein one of the first bale and the second bale provides a  
support bale for the at least one stack of bales on the substantially planar bale receiving surface of  
the load bed and is located on the substantially planar bale receiving surface of the load bed at the  
20 first position on the first axis, at the first position on the second axis and at the first position on the  
third axis; and

wherein the step of transferring the at least one stack of bales further comprises the step of:

transferring the at least one stack of bales across the substantially planar bale  
receiving surface of the load bed to a second position along the second axis responsive to the step  
25 of moving at least one of the first bale and the second bale.

4. A method for operating an agricultural bale accumulator according to claim 3 further  
comprising the step of:

determining that each of the first bale and the second bale is located on the substantially  
30 planar bale receiving surface of the load bed at the first position on the first axis, at the first  
position on the second axis and at the first position on the third axis responsive to the steps of  
receiving the first bale and receiving the second bale, respectively.

5. A method for operating an agricultural bale accumulator according to claim 3 wherein the  
35 second position on the third axis is disposed above the first position on the third axis to permit the  
first bale to be positioned above the second bale so that the second bale provides the support bale  
for the at least one stack of bales on the substantially planar bale receiving surface of the load bed.

6. A method for operating an agricultural bale accumulator according to claim 5:

wherein the step of moving the first bale further comprises the step of:

raising the first bale to the second position on the third axis which is vertically displaced above the first position on the third axis responsive to the step of receiving the first bale on the substantially planar bale receiving surface of the load bed;

5 wherein the step of moving at least one of the first bale and the second bale further comprises the step of:

lowering the first bale to contact a top surface of the second bale along the third axis responsive to the step of receiving the second bale on the substantially planar bale receiving surface of the load bed to form the at least one stack of bales on the substantially planar bale receiving surface of the load bed.

7. A method for operating an agricultural bale accumulator according to claim 3 wherein the second position on the third axis is disposed below the first position on the third axis to permit the first bale to be positioned below the second bale so that the first bale provides the support bale for the at least one stack of bales on the substantially planar bale receiving surface of the load bed.

8. A method for operating an agricultural bale accumulator according to claim 7:

wherein the step of moving the first bale further comprises the step of:

lowering the first bale to the second position on the third axis which is vertically displaced below the first position on the third axis responsive to the step of receiving the first bale on the substantially planar bale receiving surface of the load bed;

wherein the step of moving at least one of the first bale and the second bale further comprises the step of:

raising the first bale to contact a bottom surface of the second bale along the third axis responsive to the step of receiving the second bale on the substantially planar bale receiving surface of the load bed to form the at least one stack of bales on the substantially planar bale receiving surface of the load bed.

9. A method for operating an agricultural bale accumulator according to claim 153:

wherein the step of receiving further comprises the steps of:

receiving the first bale on the substantially planar bale receiving surface of the load bed at first position on the first axis, at a first position on the second axis and at a first position on the third axis; and

receiving the second bale on the substantially planar bale receiving surface of the load bed at the first position on the first axis, at the first position on the second axis and at the first position on the third axis responsive to the step of receiving the first bale;

receiving a third bale on the substantially planar bale receiving surface of the load bed at the first position on the first axis, at the first position on the second axis and at the first position on the third axis responsive to the step of receiving the second bale;

wherein the step of stacking further comprises the steps of:

moving the first bale to a second position on the third axis which is vertically displaced from the first position on the third axis responsive to the step of receiving the first bale on the substantially planar bale receiving surface of the load bed;

5 moving the second bale to a third position on the third axis which is vertically displaced from the first position on the third axis in an opposite direction from the second position on the third axis responsive to the step of receiving the second bale on the substantially planar bale receiving surface of the load bed;

10 raising the first bale, the second bale and the third bale along the third axis responsive to the step of receiving the third bale on the substantially planar bale receiving surface of the load bed to form the at least one stack of bales on the substantially planar bale receiving surface of the load bed, wherein one of the first bale and the second bale provides a support bale for the at least one stack of bales on the substantially planar bale receiving surface of the load bed and is located on the substantially planar bale receiving surface of the load bed at the first position  
15 on the first axis, at the first position on the second axis and at the first position on the third axis; and

wherein the step of transferring the at least one stack of bales further comprises the step of:

transferring the at least one stack of bales across the substantially planar bale receiving surface of the load bed to a second position along the second axis responsive to the step  
20 of raising the first bale, the second bale and the third bale.

10. A method for operating an agricultural bale accumulator according to claim 9 wherein the second position on the third axis is disposed above the first position on the third axis to permit the first bale to be positioned above the third bale and wherein the third position on the third axis is  
25 disposed below the first position on the third axis to permit the second bale to be positioned below the third bale so that the second bale provides the support bale for the at least one stack of bales on the substantially planar bale receiving surface of the load bed.

11. A method for operating an agricultural bale accumulator according to claim 9 wherein the second position on the third axis is disposed below the first position on the third axis to permit the first bale to be positioned below the third bale and wherein the third position on the third axis is  
30 disposed above the first position on the third axis to permit the second bale to be positioned above the third bale so that the first bale provides the support bale for the at least one stack of bales on the substantially planar bale receiving surface of the load bed.

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12. A method for operating an agricultural bale accumulator comprising the steps of:

receiving each of a plurality of bales on a bale receiving surface of a load bed which is substantially planar at a first position on a first axis, at a first position on a second axis which is horizontally transverse to the first axis, and at a third position on a third axis which is vertically  
40 transverse to the first axis and the second axis;

determining that each of the plurality of bales is located on the bale receiving surface of the load bed at the first position on the first axis, at the first position on the second axis and at the first position on the third axis responsive to the step of receiving each of the plurality of bales;

determining whether a predetermined number of bales are received to form a stack of bales responsive to one of the step of determining that each of the plurality of bales is located on the substantially planar bale receiving surface of the load bed;

forming the stack of bales on the bale receiving surface of the load bed at the first position on the first axis, at the first position on the second axis and at the first position on the third axis responsive to the step of determining that the predetermined number of bales are received to form the stack of bales;

determining whether at least a portion of load bed should discharge at least one stack of bales on the substantially planar bale receiving surface of the load bed responsive to the step of forming;

transferring the at least one stack of bales across the substantially planar bale receiving surface of the load bed along the second axis responsive to the step of determining that the at least a portion of load bed should not discharge the at least one stack of bales;

discharging the at least one stack of bales on the substantially planar bale receiving surface of the load bed to the ground surface responsive to the step of determining that the at least a portion of load bed should discharge the at least one stack of bales;

repeating the step of receiving responsive to one of the step of transferring and the step of discharging;

determining whether to raise or lower at least one bale of the plurality of bales received on the bale receiving surface of a load bed responsive to the step of determining that the predetermined number of bales are not received to form the stack of bales;

raising the at least one bale a predetermined distance above the substantially planar bale receiving surface of a load bed to the second position on the third axis which is vertically displaced above the first position on the third axis responsive to the step of determining to raise the at least one bale of the plurality of bales received;

repeating the step of receiving responsive to one of the step of raising;

lowering the at least one bale a predetermined distance below the substantially planar bale receiving surface of a load bed to the third position on the third axis which is vertically displaced below the first position on the third axis responsive to the step of determining to lower the at least one bale of the plurality of bales received; and

repeating the step of receiving responsive to one of the step of lowering.

13. A method for operating an agricultural bale accumulator according to claim 12 further comprising the steps of:

determining whether there is at least one bale of the plurality of bales raised above the substantially planar bale receiving surface of the load bed to a second position on the third axis

which is vertically displaced above the first position on the third axis responsive to the step of determining to raise the at least one bale of the plurality of bales received;

lowering the at least one bale raised above the substantially planar bale receiving surface of the load bed so that the bottom surface of the at least one bale raised above the substantially planar bale receiving surface of the load bed directly contacts a top surface of the bale received on the substantially planar bale receiving surface of the load bed responsive to the step of determining that there is at least one bale raised above the substantially planar bale receiving surface of the load bed; and

performing the step of raising the at least one bale a predetermined distance above the substantially planar bale receiving surface of a load bed responsive to the step of lowering the at least one bale raised above the substantially planar bale receiving surface of the load bed and the step of determining that there is not at least one bale raised above the substantially planar bale receiving surface of the load bed.

14. A method for operating an agricultural bale accumulator according to claim 12 further comprising the steps of:

determining whether there is at least one bale of the plurality of bales lowered below the substantially planar bale receiving surface of the load bed to a third position on the third axis which is vertically displaced below the first position on the third axis responsive to the step of determining to lower the at least one bale of the plurality of bales received;

raising the at least one bale lowered below the substantially planar bale receiving surface of the load bed so that the top surface of the at least one bale lowered below the substantially planar bale receiving surface of the load bed directly contacts a bottom surface of the bale received on the substantially planar bale receiving surface of the load bed responsive to the step of determining that there is at least one bale lowered below the substantially planar bale receiving surface of the load bed; and

performing the step of lowering the at least one bale a predetermined distance below the substantially planar bale receiving surface of a load bed responsive to the step of raising the at least one bale lowered below the substantially planar bale receiving surface of the load bed and the step of determining that there is not at least one bale lowered below the substantially planar bale receiving surface of the load bed.

15. A method for operating an agricultural bale accumulator comprising the steps of:

receiving at least a first bale on a substantially planar bale receiving surface of a load bed at a first position on a first axis, at a first position on a second axis which is horizontally transverse to the first axis, and at a third position on a third axis which is vertically transverse to the first axis and the second axis;

determining that the first bale is located on the substantially planar bale receiving surface of the load bed at the first position on the first axis, at the first position on the second axis and at the first position on the third axis responsive to the step of receiving the first bale;

raising the first bale above the substantially planar bale receiving surface of a load bed a predetermined distance to a second position on the third axis which is vertically displaced above the first position on the third axis responsive to the step of determining that the first bale is located on the substantially planar bale receiving surface of the load bed;

5 receiving at least a second bale on the substantially planar bale receiving surface of a load bed at the first position on the first axis, at the first position on the second axis, and at the first position on the third axis;

determining that the second bale is located on the substantially planar bale receiving surface of the load bed at the first position on the first axis, at the first position on the second axis  
10 and at the first position on the third axis responsive to the step of receiving the second bale;

lowering the first bale so that the bottom surface of the first bale directly contacts a top surface of the second bale responsive to the step of determining that the second bale is located on the substantially planar bale receiving surface of the load bed to form at least one stack of bales on the substantially planar bale receiving surface of the load bed;

15 transferring the at least one stack of bales across the substantially planar bale receiving surface of the load bed along the second axis responsive to the step of lowering; and

discharging the at least one stack of bales on the substantially planar bale receiving surface of the load bed to the ground surface.

20 16. A method for operating an agricultural bale accumulator comprising the steps of:

receiving each of a plurality of bales on a substantially planar bale receiving surface of a load bed at a first position on a first axis, at a first position on a second axis which is horizontally transverse to the first axis, and at a third position on a third axis which is vertically transverse to the first axis and the second axis;

25 determining that each of the plurality of bales is located on the substantially planar bale receiving surface of the load bed at the first position on the first axis, at the first position on the second axis and at the first position on the third axis responsive to the step of receiving each of the plurality of bales;

determining whether the at least one stack of bales includes a predetermined number of  
30 bales forming a complete stack of bales responsive to the step of determining that each of the plurality of bales is located on the substantially planar bale receiving surface of the load bed;

raising at least one bale a predetermined distance above the substantially planar bale receiving surface of a load bed to the second position on the third axis which is vertically displaced above the first position on the third axis responsive to the step of determining that the at  
35 least one stack of bales does not include the predetermined number of bales;

determining whether at least a portion of load bed should discharge the at least one stack of bales on the substantially planar bale receiving surface of the load bed responsive to the step of determining that the at least one stack of bales includes the predetermined number of bales;

transferring the at least one stack of bales across the substantially planar bale receiving surface of the load bed along the second axis responsive to the step of determining that the at least a portion of load bed should not discharge the at least one stack of bales;

discharging the at least one stack of bales on the substantially planar bale receiving surface of the load bed to the ground surface responsive to the step of determining that the at least a portion of load bed should discharge the at least one stack of bales; and

repeating the step of receiving responsive to one of the step of raising, the step of transferring and the step of discharging.

- 10 17. A method for operating an agricultural bale accumulator according to claim 16 further comprising the steps of:

determining whether there is at least one bale raised above the substantially planar bale receiving surface of the load bed to a second position on the third axis which is vertically displaced above the first position on the third axis responsive to the step of determining that each of the plurality of bales is located on the substantially planar bale receiving surface of the load bed;

lowering the at least one bale raised above the substantially planar bale receiving surface of the load bed so that the bottom surface of the at least one bale directly contacts a top surface of the of one of the plurality of bales located on the substantially planar bale receiving surface of the load bed responsive to the step of determining that there is at least one bale raised above the substantially planar bale receiving surface of the load bed to form at least one stack of bales on the substantially planar bale receiving surface of the load bed; and

performing the step of determining whether the at least one stack of bales includes the predetermined number of bales forming the complete stack of bales responsive to one of the step of determining that there is not at least one bale raised above the substantially planar bale receiving surface of the load bed and the step of lowering.

18. A method for operating an agricultural bale accumulator comprising the steps of:

receiving at least a first bale on a substantially planar bale receiving surface of a load bed at a first position on a first axis, at a first position on a second axis which is horizontally transverse to the first axis, and at a third position on a third axis which is vertically transverse to the first axis and the second axis;

determining that the first bale is located on the substantially planar bale receiving surface of the load bed at the first position on the first axis, at the first position on the second axis and at the first position on the third axis responsive to the step of receiving the first bale;

lowering the first bale below the substantially planar bale receiving surface of a load bed a predetermined distance to a second position on the third axis which is vertically displaced below the first position on the third axis responsive to the step of determining that the first bale is located on the substantially planar bale receiving surface of the load bed;

receiving at least a second bale on the substantially planar bale receiving surface of a load bed at the first position on the first axis, at the first position on the second axis, and at the third position on the third axis;

determining that the second bale is located on the substantially planar bale receiving surface of the load bed at the first position on the first axis, at the first position on the second axis and at the first position on the third axis responsive to the step of receiving the second bale;

raising the first bale through the predetermined distance causing the top surface of the first bale to directly contact a bottom surface of the second bale so that the first bale and the second bale raise together until a bottom surface of the first bale is at least co-planar with the bale receiving surface of the load bed responsive to the step of determining that the second bale is located on the substantially planar bale receiving surface of the load bed to form at least one stack of bales on the substantially planar bale receiving surface of the load bed;

transferring the at least one stack of bales across the substantially planar bale receiving surface of the load bed along the second axis responsive to the step of lowering; and

discharging the at least one stack of bales on the substantially planar bale receiving surface of the load bed to the ground surface.

19. A method for operating an agricultural bale accumulator comprising the steps of:

receiving each of a plurality of bales on a substantially planar bale receiving surface of a load bed at a first position on a first axis, at a first position on a second axis which is horizontally transverse to the first axis, and at a third position on a third axis which is vertically transverse to the first axis and the second axis;

determining that each of the plurality of bales is located on the substantially planar bale receiving surface of the load bed at the first position on the first axis, at the first position on the second axis and at the first position on the third axis responsive to the step of receiving each of the plurality of bales;

determining whether the at least one stack of bales includes a predetermined number of bales forming a complete stack of bales responsive to the step of determining that each of the plurality of bales is located on the substantially planar bale receiving surface of the load bed;

lowering a partial stack of at least one bale a predetermined distance below the substantially planar bale receiving surface of a load bed to the third position on the third axis which is vertically displaced below the first position on the third axis responsive to the step of determining that the at least one stack of bales does not include the predetermined number of bales;

determining whether at least a portion of load bed should discharge the at least one stack of bales on the substantially planar bale receiving surface of the load bed responsive to the step of determining that the at least one stack of bales includes the predetermined number of bales;

transferring the at least one stack of bales across the substantially planar bale receiving surface of the load bed along the second axis responsive to the step of determining that the at least a portion of load bed should not discharge the at least one stack of bales;



discharging the at least one stack of bales on the substantially planar bale receiving surface of the load bed to the ground surface responsive to the step of determining that the at least a portion of load bed should discharge the at least one stack of bales; and

repeating the step of receiving responsive to one of the step of lowering, the step of transferring and the step of discharging.

20. A method for operating an agricultural bale accumulator according to claim 19 further comprising the steps of:

determining whether there is at least one bale lowered below the substantially planar bale receiving surface of the load bed to a third position on the third axis which is vertically displaced below the first position on the third axis responsive to the step of determining that each of the plurality of bales is located on the substantially planar bale receiving surface of the load bed;

raising the at least one bale lowered below the substantially planar bale receiving surface of the load bed so that the top surface of the at least one bale directly contacts a bottom surface of the of one of the plurality of bales located on the substantially planar bale receiving surface of the load bed responsive to the step of determining that there is at least one bale lowered below the substantially planar bale receiving surface of the load bed to form at least one stack of bales on the substantially planar bale receiving surface of the load bed; and

performing the step of determining whether the at least one stack of bales includes the predetermined number of bales forming the complete stack of bales responsive to one of the step of determining that there is not at least one bale lowered below the substantially planar bale receiving surface of the load bed and the step of raising.

21. A method for operating an agricultural bale accumulator, the method comprising the steps of:

receiving at least a first bale and a second bale on a substantially planar bale receiving surface of a load bed along a first axis;

transferring the first bale and the second bale across the substantially planar bale receiving surface of the load bed along a second axis which is horizontally transverse to the first axis; and

stacking the first bale in direct contact with the second bale along a third axis which is vertically transverse to the first axis and the second axis responsive to the step of transferring to form at least one stack of bales on the substantially planar bale receiving surface of the load bed.

#### Stacking Module:

1. A method for operating an agricultural bale accumulator comprising the steps of:

receiving a first plurality of bales along a first axis on a first load bed disposed in a first position along a third axis which is vertically transverse to the first axis;

raising the first load bed with the first plurality of bales disposed thereon to a second position on the third axis a predetermined distance above the first position on the third axis responsive to the step of receiving the first plurality of bales; and

receiving a second plurality of bales along the first axis on a second load bed which is disposed substantially in the first position along the third axis below the first load bed responsive to the step of raising.

2. A method for operating an agricultural bale accumulator according to claim 1 wherein the agricultural bale accumulator is supported by a ground surface and wherein the method further comprises the step of:

discharging at least one of the first plurality of bales on the first load bed and the second plurality of bales on the second load bed to the ground surface.

3. A method for operating an agricultural bale accumulator according to claim 2 wherein the step of discharging further comprises the steps of:

discharging the second plurality of bales on the second load bed to the ground surface; and

discharging the first plurality of bales on the first load bed to the ground surface responsive to the step of discharging the first layer of bales,

wherein the first layer of bales and the second layer of bales form a single layer of bales disposed in a common plane on the ground surface.

4. A method for operating an agricultural bale accumulator according to claim 2 further comprising the step of:

lowering the first load bed to the first position along the third axis responsive to the step of discharging the second layer of bales,

wherein the step of discharging the first plurality of bales on the first load bed to the ground surface is responsive to the step of lowering the first load bed.

5. A method for operating an agricultural bale accumulator according to claim 3 wherein the step of discharging further comprises the steps of:

discharging the second plurality of bales on the second load bed to the ground surface;

and

discharging the first plurality of bales on the first load bed to a top surface of the second plurality of bales responsive to the step of discharging the second plurality of bales to form a plurality of stacks of bales on the ground surface.

6. A method for operating an agricultural bale accumulator according to claim 1 further comprising the steps of:

determining that the first load bed has accumulated a predetermined number of the first plurality of bales responsive to the step of receiving the first plurality of bales,

wherein the step of raising the first load bed is responsive to the step of determining.

7. A method for operating an agricultural bale accumulator according to claim 1 further comprising the steps of:

transferring the first plurality of bales across the first load bed along a second axis which is horizontally transverse to the first axis and the third axis responsive to the step of receiving the first plurality of bales to permit the first load bed to accumulate a first layer of bales.

8. A method for operating an agricultural bale accumulator according to claim 1 further comprising the steps of:

transferring the second plurality of bales across the second load bed along a second axis which is horizontally transverse to the first axis and the third axis responsive to the step of receiving the second plurality of bales to permit the second load bed to accumulate a second layer of bales.

9. A method for operating an agricultural bale accumulator comprising the steps of:

receiving a first plurality of bales along a first axis on a first load bed disposed in a first position along a third axis which is vertically transverse to the first axis;

transferring the first plurality of bales across the first load bed along a second axis which is horizontally transverse to the first axis and the third axis responsive to the step of receiving the first plurality of bales to permit the first load bed to accumulate a first layer of bales;

raising the first load bed with the first layer of bales disposed thereon to a second position on the third axis a predetermined distance above the first position on the third axis responsive to the step of transferring the first plurality of bales;

receiving a second plurality of bales along the first axis on a second load bed which is disposed substantially in the first position along the third axis below the first load bed responsive to the step of raising; and

transferring the second plurality of bales across the second load bed along the second axis responsive to the step of receiving the second plurality of bales to permit the second load bed to accumulate a second layer of bales.

10. A method for operating an agricultural bale accumulator according to claim 9 wherein the agricultural bale accumulator is supported by a ground surface and wherein the method further comprises the step of:

discharging at least one of the first layer of bales on the first load bed and the second layer of bales on the second load bed to the ground surface.

11. A method for operating an agricultural bale accumulator according to claim 10 wherein the step of discharging further comprises the steps of:

discharging the second layer of bales on the second load bed to the ground surface; and

discharging the first layer of bales on the first load bed to the ground surface responsive to the step of discharging the first layer of bales,

wherein the first layer of bales and the second layer of bales form a single layer of bales disposed in a common plane on the ground surface.

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12. A method for operating an agricultural bale accumulator according to claim 11 further comprising the step of:

lowering the first load bed to the first position along the third axis responsive to the step of discharging the second layer of bales,

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wherein the step of discharging the first layer of bales on the first load bed to the ground surface is responsive to the step of lowering the first load bed.

13. A method for operating an agricultural bale accumulator according to claim 10 wherein the step of discharging further comprises the steps of:

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discharging the second layer of bales on the second load bed to the ground surface; and

discharging the first layer of bales on the first load bed to a top surface of the second layer of bales responsive to the step of discharging the second layer of bales to form a plurality of stacks of bales on the ground surface.

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14. A method for operating an agricultural bale accumulator according to claim 9 further comprising the steps of:

determining that the first load bed has accumulated a predetermined number of the first plurality of bales to form the first layer of bales responsive to the step of transferring the first plurality of bales,

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wherein the step of raising the first load bed is responsive to the step of determining.

15. A method for operating an agricultural bale accumulator, the method comprising the steps of:

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receiving a first plurality of bales along a first axis on a first load bed disposed in a first position along a third axis which is vertically transverse to the first axis;

transferring the first plurality of bales across the first load bed along a second axis which is horizontally transverse to the first axis and the third axis to position the first plurality of bales in a side-by-side relationship on the first load bed responsive to the step of receiving the first plurality of bales to permit the first load bed to accumulate a first layer of bales;

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determining that the first load bed has accumulated a first predetermined number of the first plurality of bales to form the first layer of bales responsive to the step of transferring the first plurality of bales;

raising the first load bed with the first layer of bales disposed thereon to a second position on the third axis a predetermined distance above the first position on the third axis responsive to

the step of determining that the first load bed has accumulated the first predetermined number of the first plurality of bales;

receiving a second plurality of bales along the first axis on a second load bed which is disposed substantially in the first position along the third axis below the second load bed responsive to the step of raising;

transferring the second plurality of bales across the second load bed along the second axis to position the second plurality of bales in a side-by-side relationship on the second load bed responsive to the step of receiving the second plurality of bales to permit the second load bed to accumulate a second layer of bales;

determining that the second load bed has accumulated a second predetermined number of the second plurality of bales to form the second layer of bales responsive to the step of transferring the second plurality of bales;

discharging the first layer of bales on the first load bed and the second layer of bales on the second load bed to the ground surface responsive to the step of determining that the second load bed has accumulated the second predetermined number of the second plurality of bales; and

lowering the first load bed to the first position along the third axis responsive to the step of discharging at least the second layer of bales.

16. A method for operating an agricultural bale accumulator according to claim 15 wherein the step of discharging further comprises the steps of:

discharging the second layer of bales on the second load bed to the ground surface; and  
discharging the first layer of bales on the first load bed to the ground surface responsive to the step of discharging the first layer of bales,

wherein the first layer of bales and the second layer of bales form a single layer of bales disposed in a common plane on the ground surface.

17. A method for operating an agricultural bale accumulator according to claim 15 wherein the step of discharging further comprises the steps of:

discharging the second layer of bales on the second load bed to the ground surface; and  
discharging the first layer of bales on the first load bed to a top surface of the second layer of bales responsive to the step of discharging the second layer of bales to form a plurality of stacks of bales on the ground surface.

18. A method for operating an agricultural bale accumulator, the method comprising the steps of:

receiving a plurality of bales along a first axis on a first load bed disposed substantially in a first position along a third axis which is vertically transverse to the first axis;

determining whether the first load bed has accumulated thereon a first predetermined number of the plurality of bales responsive to the step of receiving the plurality of bales along the first axis on the first load bed;

transferring the plurality of bales received on the first load bed across the first load bed along a second axis which is horizontally transverse to the first axis and the third axis to position the plurality of bales in a side-by-side relationship on the first load bed responsive to the step of determining that the first load bed has not accumulated the first predetermined number of the plurality of bales on the first load bed;

raising the first load bed and the plurality of bales disposed thereon to a second position on the third axis which is a predetermined distance above a second load bed disposed substantially in a first position along a third axis responsive to the step of determining that the first load bed has accumulated thereon the first predetermined number of the plurality of bales;

receiving the plurality of bales along the first axis on a second load bed disposed substantially in the first position along the third axis;

determining whether the second load bed has accumulated thereon a second predetermined number of the plurality of bales responsive to the step of receiving the plurality of bales along the first axis on the second load bed;

transferring the plurality of bales received on the second load bed across the second load bed along the second axis which is horizontally transverse to the first axis and the third axis to position the plurality of bales in a side-by-side relationship on the second load bed responsive to the step of determining that the second load bed has not accumulated the second predetermined number of the plurality of bales on the second load bed;

discharging at least the plurality of bales on the second load bed to the ground surface responsive to the step of determining that the second load bed has accumulated thereon a predetermined number of the plurality of bales; and

lowering the first load bed to the first position along the third axis responsive to the step of discharging the at least the plurality of bales on the second load bed to the ground surface.

#### Stacking Module:

1. A method for operating an agricultural bale accumulator comprising the steps of:

receiving a plurality of bales on a second load bed along a first axis;

accumulating the plurality of bales on at least one of a first load bed and the second load bed responsive to the step of receiving, wherein the first load bed is located a predetermined distance above the second load bed, wherein a portion of the second load bed is moveable between a stowed position and an unstowed position along a third axis which is vertically transverse to the first axis, wherein the portion of the load bed is in the stowed position at a first position on the third axis when a bale receiving surface of the portion of the load bed is coplanar with a bale receiving surface of the second load bed, wherein the portion of the load is in the unstowed position at a second position on the third axis when the bale receiving surface of the portion of the load bed is coplanar with a bale receiving surface of the first load bed, and wherein the portion of the second load bed is disposed on the first axis to receive the plurality of bales,

wherein the step of accumulating is performed by moving the portion of the load bed having at least one bale disposed thereon between the stowed position and the unstowed position

responsive to the step of receiving to permit the agricultural bale accumulator to accumulate at least one of a first layer of bales on the first load bed and a second layer of bales on the second load bed.

2. A method for operating an agricultural bale accumulator according to claim 1 wherein the step of accumulating further comprises the steps of:

transferring a second plurality of bales across the second load bed along the second axis responsive to the step of receiving the plurality of bales on the second load bed to permit the second load bed to accumulate a second layer of bales;

raising each of a first plurality of bales received on the bale receiving surface of the portion of the second load bed to a location along a third axis which is vertically transverse to the first axis and the second axis so that a bottom surface of each of the first plurality of bales raised is substantially coplanar with the bale receiving surface of the bale receiving surface first load bed responsive to the step of receiving the plurality of bales on the second load bed;

transferring at least one of the first plurality of bales across the second load bed along the second axis responsive to the step of raising to permit the first load bed to accumulate the first layer of bales.

3. A method for operating an agricultural bale accumulator according to claim 2 further comprising the step of:

determining that the first load bed has accumulated a predetermined number of the first plurality of bales to form the first layer of bales responsive to the step of transferring the first plurality of bales,

wherein the step of receiving the second plurality of bales on the second load bed occurs responsive to the step of determining.

4. A method for operating an agricultural bale accumulator according to claim 1 wherein the agricultural bale accumulator is supported by a ground surface and wherein the method further comprises the steps of:

discharging the second layer of bales on the second load bed to the ground surface; and  
discharging the first layer of bales on the first load bed to the ground surface responsive to the step of discharging the first layer of bales.

5. A method for operating an agricultural bale accumulator according to claim 1 wherein the agricultural bale accumulator is supported by a ground surface and wherein the method further comprises the steps of:

discharging the second layer of bales on the second load bed to the ground surface; and  
discharging the first layer of bales on the first load bed to a top surface of the second layer of bales responsive to the step of discharging the second layer of bales to form a plurality of stacks of bales on the ground surface.

## Bale Advancement Module:

1. An agricultural bale accumulator comprising:

5 a load bed adapted to receive thereon a plurality of bales, including a first bale followed by a second bale, at a first rate of speed along a bale receiving axis;

a first bale position sensor adapted to determine that the first bale is located a first predetermined position on the load bed along the bale receiving axis responsive to the receipt of the first bale on the load bed;

10 a bale advancement module adapted to advance the first bale onto the load bed at a second rate of speed, greater than the first rate of speed, along the bale receiving axis responsive to the determination that the first bale is located in the first predetermined position along the bale receiving axis to advance the first bale ahead of the second bale by a predetermined distance along the bale receiving axis; and

15 a bale handling module adapted to handle the first bale received on the load bed in a first amount of time less than a second amount of time required for the second bale to move through the predetermined distance at the first rate of speed along the bale receiving axis responsive to the advancement of the first bale onto the load bed along the bale receiving axis.

20 2. An agricultural bale accumulator according to claim 1:

wherein the agricultural bale accumulator is adapted to be pulled in tandem behind an agricultural baler in a direction of travel across a ground surface,

25 wherein the plurality of bales are ejected from a bale chamber of the agricultural baler at the first rate of speed along the bale receiving axis in a bale traveling direction essentially opposite to the direction of travel,

wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the load bed along the bale receiving axis in the bale traveling direction, and

30 wherein the first bale is located in the first predetermined position on the load bed along the bale receiving axis responsive to the first bale being completely formed and ejected from the bale chamber of the agricultural baler.

3. An agricultural bale accumulator according to claim 2 wherein the first bale position sensor further comprises:

35 a bale position monitoring mechanism adapted to monitor the formation of and the ejection of the first bale from the bale chamber of the agricultural baler.

4. An agricultural bale accumulator according to claim 1 wherein the first bale position sensor further comprises:



a sensing plate located at the first predetermined position along the bale receiving axis and moveable between a first position and a second position, wherein the sensing plate is located in the first position responsive to the first bale not applying a force to the sensing plate, and wherein the sensing plate is located in the second position responsive to the first bale applying a force to the sensing plate; and

a switch coupled to the sensing plate and having a first switched state, indicative of the first bale not being located in the first predetermined position, responsive to the sensing plate being located in the first position and a second switch state, indicative of the first bale being located in the first predetermined position, responsive to the sensing plate being located in the second position.

5. An agricultural bale accumulator according to claim 1 further comprising:

a first bale position sensor adjustment mechanism adapted to adjust the first predetermined position of the first bale position sensor along the bale receiving axis.

6. An agricultural bale accumulator according to claim 5 wherein the first bale position sensor adjustment mechanism is adapted to adjust the first predetermined position of the first bale position sensor along the bale receiving axis by physically relocating the first bale position sensor along the bale receiving axis.

7. An agricultural bale accumulator according to claim 1 further comprising:

a second bale position sensor adapted to determine that the first bale is located in a second predetermined position along the bale receiving axis ahead of the first predetermined position along the bale receiving axis by the predetermined distance responsive to the advancement of the first bale onto the load bed along the bale receiving axis,

wherein the bale handling module is adapted to handle the first bale responsive to the determination that the first bale is located in the second predetermined position.

8. An agricultural bale accumulator according to claim 7 further comprising:

a second bale position sensor adjustment mechanism adapted to adjust the second predetermined position along the bale receiving axis.

9. An agricultural bale accumulator according to claim 7:

wherein the bale advancement module is adapted to stop the advancement of the first bale onto the load bed along the bale receiving axis responsive to the determination that the first bale is located in the second predetermined position along the bale receiving axis, and

wherein the bale handling module is adapted to handle the first bale responsive to the bale advancement module stopping the advancement of the first bale onto the load bed along the bale receiving axis.

10. An agricultural bale accumulator according to claim 1 wherein the bale advancement module further comprises:

a bale engaging mechanism adapted to engage the first bale; and

a bale driving mechanism coupled to the bale engaging mechanism and adapted to cause the bale engaging mechanism to engage the first bale and to drive the bale engaging mechanism to advance the first bale ahead of the second bale by the predetermined distance along the bale receiving axis.

11. An agricultural bale accumulator according to claim 10 wherein the bale engaging mechanism further comprises:

at least one projection adapted to protrude at least partially into the first bale when engaging the first bale; and

a projection support surface coupled to the at least one projection so that the at least one projection extends outwardly from the projection support surface.

12. An agricultural bale accumulator according to claim 11:

wherein the projection support surface is disposed below a bale receiving surface of the load bed upon which the first bale is received on the load bed, and

wherein the at least one projection is permitted to extend above the bale receiving surface of the load bed to protrude at least partially into the first bale.

13. An agricultural bale accumulator according to claim 11 wherein the projection support surface further comprises:

a cylinder having a circular shaped cross-section and positioned so that rotation of the cylinder causes the first bale to advance ahead of the second bale by the predetermined distance along the bale receiving axis.

14. An agricultural bale accumulator according to claim 11 wherein the projection support surface further comprises:

a chain forming a closed loop and positioned so that rotation of the chain causes the first bale to advance ahead of the second bale by the predetermined distance along the bale receiving axis.

15. An agricultural bale accumulator according to claim 1 wherein the bale handling module further comprises:

a bale discharge module adapted to discharge the first bale received on the load bed to a ground surface responsive to at least the first bale being advanced onto the load bed.

16. An agricultural bale accumulator according to claim 15 wherein the bale discharge module further comprises:

5 a pivot mechanism adapted to pivot the load bed from a bale receiving position to a bale discharging position to cause the first bale to be discharged to the ground surface under gravitational force acting on at least the first bale, wherein the load bed assumes a horizontal position relative to a frame supporting the load bed when the load bed is in the bale receiving position, wherein the load bed assumes an inclined position relative to the frame supporting the load bed when the load bed is in the bale discharging position, and wherein the load bed pivots from the bale receiving position, to the bale discharging position and back to the bale receiving position in the first amount of time less than the second amount of time required for the second bale to move through the predetermined distance along the bale receiving axis at the first rate of speed responsive to the first bale being advanced onto the load bed.

17. An agricultural bale accumulator according to claim 1 wherein the bale handling module further comprises:

15 a bale stacking module adapted to stack the first bale with respect to the second bale along a bale stacking axis vertically transverse to the bale receiving axis responsive to the first bale being advanced onto the load bed along the bale receiving axis to position the first bale and the second bale in a stacked relationship on the load bed.

18. An agricultural bale accumulator according to claim 1 wherein the bale handling module further comprises:

20 a bale transfer module adapted to transfer at least the first bale across the load bed along a bale transfer axis horizontally transverse to the bale receiving axis responsive to the first bale being advanced onto the load bed to position the first bale and the second bale in a side-by-side relationship on the load bed.

19. An agricultural bale accumulator adapted to be pulled in tandem behind an agricultural baler in a direction of travel across a ground surface, the agricultural bale accumulator comprising:

30 a load bed adapted to receive thereon a plurality of bales, including a first bale followed by a second bale, at a first rate of speed along a bale receiving axis, wherein the plurality of bales are ejected from a bale chamber of the agricultural baler at the first rate of speed along the bale receiving axis in a bale traveling direction essentially opposite to the direction of travel, and wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the load bed along the bale receiving axis in the bale traveling direction;

35 a first bale position sensor adapted to determine that the first bale is located a first predetermined position on the load bed along the bale receiving axis responsive to the receipt of the first bale on the load bed, wherein the first bale is located in the first predetermined position on

the load bed along the bale receiving axis responsive to the first bale being completely formed and ejected from the bale chamber of the agricultural baler;

a bale advancement module adapted to advance the first bale onto the load bed at a second rate of speed, greater than the first rate of speed, along the bale receiving axis responsive to the determination that the first bale is located in the first predetermined position along the bale receiving axis to advance the first bale ahead of the second bale by a predetermined distance along the bale receiving axis; and

a bale handling module adapted to handle the first bale received on the load bed in a first amount of time less than a second amount of time required for the second bale to move through the predetermined distance at the first rate of speed along the bale receiving axis responsive to the advancement of the first bale onto the load bed along the bale receiving axis, wherein the bale handling module further comprises:

a bale discharge module adapted to discharge the first bale received on the load bed to a ground surface responsive to at least the first bale being advanced onto the load bed, wherein the bale discharge module further comprises:

a pivot mechanism adapted to pivot the load bed from a bale receiving position to a bale discharging position to cause the first bale to be discharged to the ground surface under gravitational force acting on at least the first bale, wherein the load bed assumes a horizontal position relative to a frame supporting the load bed when the load bed is in the bale receiving position, wherein the load bed assumes an inclined position relative to the frame supporting the load bed when the load bed is in the bale discharging position, and wherein the load bed pivots from the bale receiving position, to the bale discharging position and back to the bale receiving position in the first amount of time less than the second amount of time required for the second bale to move through the predetermined distance along the bale receiving axis at the first rate of speed responsive to at least the first bale being advanced onto the load bed.

20. An agricultural bale accumulator according to claim 19 wherein the first bale position sensor further comprises:

a bale position monitoring mechanism adapted to monitor the formation of and the ejection of the first bale from the bale chamber of the agricultural baler.

21. An agricultural bale accumulator according to claim 19 wherein the first bale position sensor further comprises:

a sensing plate located at the first predetermined position along the bale receiving axis and moveable between a first position and a second position, wherein the sensing plate is located in the first position responsive to the first bale not applying a force to the sensing plate, and wherein the sensing plate is located in the second position responsive to the first bale applying a force to the sensing plate; and

a switch coupled to the sensing plate and having a first switched state, indicative of the first bale not being located in the first predetermined position, responsive to the sensing plate

being located in the first position and a second switch state, indicative of the first bale being located in the first predetermined position, responsive to the sensing plate being located in the second position.

- 5 22. An agricultural bale accumulator according to claim 19 further comprising:  
a first bale position sensor adjustment mechanism adapted to adjust the first predetermined position of the first bale position sensor along the bale receiving axis.

- 10 23. An agricultural bale accumulator according to claim 22 wherein the first bale position sensor adjustment mechanism is adapted to adjust the first predetermined position of the first bale position sensor along the bale receiving axis by physically relocating the first bale position sensor along the bale receiving axis.

- 15 24. An agricultural bale accumulator according to claim 19 further comprising:  
a second bale position sensor adapted to determine that the first bale is located in a second predetermined position along the bale receiving axis ahead of the first predetermined position along the bale receiving axis by the predetermined distance responsive to the advancement of the first bale onto the load bed along the bale receiving axis,

- 20 wherein the bale handling module is adapted to handle the first bale responsive to the determination that the first bale is located in the second predetermined position.

- 25 25. An agricultural bale accumulator according to claim 24 further comprising:  
a second bale position sensor adjustment mechanism adapted to adjust the second predetermined position along the bale receiving axis.

26. An agricultural bale accumulator according to claim 24:  
wherein the bale advancement module is adapted to stop the advancement of the first bale onto the load bed along the bale receiving axis responsive to the determination that the first bale is located in the second predetermined position along the bale receiving axis, and  
30 wherein the bale handling module is adapted to handle the first bale responsive to the bale advancement module stopping the advancement of the first bale onto the load bed along the bale receiving axis.

- 35 27. An agricultural bale accumulator according to claim 19 wherein the bale advancement module further comprises:

- a bale engaging mechanism adapted to engage the first bale; and  
a bale driving mechanism coupled to the bale engaging mechanism and adapted to cause the bale engaging mechanism to engage the first bale and to drive the bale engaging mechanism to advance the first bale ahead of the second bale by the predetermined distance along the bale  
40 receiving axis.

28. An agricultural bale accumulator according to claim 27 wherein the bale engaging mechanism further comprises:

at least one projection adapted to protrude at least partially into the first bale when engaging the first bale; and

a projection support surface coupled to the at least one projection so that the at least one projection extends outwardly from the projection support surface.

29. An agricultural bale accumulator according to claim 28:

wherein the projection support surface is disposed below a bale receiving surface of the load bed upon which the first bale is received on the load bed, and

wherein the at least one projection is permitted to extend above the bale receiving surface of the load bed to protrude at least partially into the first bale.

30. An agricultural bale accumulator according to claim 29 wherein the projection support surface further comprises:

a cylinder having a circular shaped cross-section and positioned so that rotation of the cylinder causes the first bale to advance ahead of the second bale by the predetermined distance along the bale receiving axis.

31. An agricultural bale accumulator according to claim 29 wherein the projection support surface further comprises:

a chain forming a closed loop and positioned so that rotation of the chain causes the first bale to advance ahead of the second bale by the predetermined distance along the bale receiving axis.

32. An agricultural bale accumulator according to claim 19 wherein the bale handling module further comprises:

a bale stacking module adapted to stack the first bale with respect to the second bale along a bale stacking axis vertically transverse to the bale receiving axis responsive to the first bale being advanced onto the load bed along the bale receiving axis to position the first bale and the second bale in a stacked relationship on the load bed.

33. An agricultural bale accumulator according to claim 19 wherein the bale handling module further comprises:

a bale transfer module adapted to transfer at least the first bale across the load bed along a bale transfer axis horizontally transverse to the bale receiving axis responsive to the first bale being advanced onto the load bed to position the first bale and the second bale in a side-by-side relationship on the load bed.

34. An agricultural bale accumulator adapted to be pulled in tandem behind an agricultural baler in a direction of travel across a ground surface, the agricultural bale accumulator comprising:

5 a load bed adapted to receive thereon a plurality of bales, including a first bale followed by a second bale, at a first rate of speed along a bale receiving axis, wherein the plurality of bales are ejected from a bale chamber of the agricultural baler at the first rate of speed along the bale receiving axis in a bale traveling direction essentially opposite to the direction of travel, and wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the load bed along the bale receiving axis  
10 in the bale traveling direction;

a first bale position sensor adapted to determine that the first bale is located a first predetermined position on the load bed along the bale receiving axis responsive to the receipt of the first bale on the load bed, wherein the first bale is located in the first predetermined position on the load bed along the bale receiving axis responsive to the first bale being completely formed and ejected from the bale chamber of the agricultural baler;  
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a bale advancement module adapted to advance the first bale onto the load bed at a second rate of speed, greater than the first rate of speed, along the bale receiving axis responsive to the determination that the first bale is located in the first predetermined position along the bale receiving axis to advance the first bale ahead of the second bale by a predetermined distance along the bale receiving axis, wherein the bale advancement module further comprises:  
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a bale engaging mechanism adapted to engage the first bale, wherein the bale engaging mechanism further comprises:

at least one projection adapted to protrude at least partially into the first bale when engaging the first bale; and  
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a projection support surface coupled to the at least one projection so that the at least one projection extends outwardly from the projection support surface; and

a bale driving mechanism coupled to the bale engaging mechanism and adapted to cause the bale engaging mechanism to engage the first bale and to drive the bale engaging mechanism to advance the first bale ahead of the second bale by the predetermined distance along the bale receiving axis;  
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a second bale position sensor adapted to determine that the first bale is located in a second predetermined position along the bale receiving axis ahead of the first predetermined position along the bale receiving axis by the predetermined distance responsive to the advancement of the first bale onto the load bed along the bale receiving axis, wherein the bale advancement module is adapted to stop the advancement of the first bale onto the load bed along the bale receiving axis responsive to the determination that the first bale is located in the second predetermined position along the bale receiving axis; and  
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a bale handling module adapted to handle the first bale received on the load bed in a first amount of time less than a second amount of time required for the second bale to move through the predetermined distance at the first rate of speed along the bale receiving axis responsive to the  
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bale advancement module stopping the advancement of the first bale onto the load bed along the bale receiving axis, wherein the bale handling module further comprises:

a bale discharge module adapted to discharge the first bale received on the load bed to a ground surface responsive to the bale advancement module stopping the advancement of at least the first bale onto the load bed along the bale receiving axis, wherein the bale discharge module further comprises:

a pivot mechanism adapted to pivot the load bed from a bale receiving position to a bale discharging position to cause the first bale to be discharged to the ground surface under gravitational force acting on at least the first bale, wherein the load bed assumes a horizontal position relative to a frame supporting the load bed when the load bed is in the bale receiving position, wherein the load bed assumes an inclined position relative to the frame supporting the load bed when the load bed is in the bale discharging position, and wherein the load bed pivots from the bale receiving position, to the bale discharging position and back to the bale receiving position in the first amount of time less than the second amount of time required for the second bale to move through the predetermined distance along the bale receiving axis at the first rate of speed responsive to at least the first bale being advanced onto the load bed.

35. An agricultural bale accumulator according to claim 34 wherein the first bale position sensor further comprises:

a bale position monitoring mechanism adapted to monitor the formation of and the ejection of the first bale from the bale chamber of the agricultural baler.

36. An agricultural bale accumulator according to claim 34 wherein the first bale position sensor further comprises:

a sensing plate located at the first predetermined position along the bale receiving axis and moveable between a first position and a second position, wherein the sensing plate is located in the first position responsive to the first bale not applying a force to the sensing plate, and wherein the sensing plate is located in the second position responsive to the first bale applying a force to the sensing plate; and

a switch coupled to the sensing plate and having a first switched state, indicative of the first bale not being located in the first predetermined position, responsive to the sensing plate being located in the first position and a second switch state, indicative of the first bale being located in the first predetermined position, responsive to the sensing plate being located in the second position.

37. An agricultural bale accumulator according to claim 34 further comprising:

a first bale position sensor adjustment mechanism adapted to adjust the first predetermined position of the first bale position sensor along the bale receiving axis.



38. An agricultural bale accumulator according to claim 37 wherein the first bale position sensor adjustment mechanism is adapted to adjust the first predetermined position of the first bale position sensor along the bale receiving axis by physically relocating the first bale position sensor along the bale receiving axis.

39. An agricultural bale accumulator according to claim 34 further comprising:  
a second bale position sensor adjustment mechanism adapted to adjust the second predetermined position along the bale receiving axis.

40. An agricultural bale accumulator according to claim 34:  
wherein the projection support surface is disposed below a bale receiving surface of the load bed upon which the first bale is received on the load bed, and  
wherein the at least one projection is permitted to extend above the bale receiving surface of the load bed to protrude at least partially into the first bale.

41. An agricultural bale accumulator according to claim 34 wherein the projection support surface further comprises:  
a cylinder having a circular shaped cross-section and positioned so that rotation of the cylinder causes the first bale to advance ahead of the second bale by the predetermined distance along the bale receiving axis.

42. An agricultural bale accumulator according to claim 34 wherein the projection support surface further comprises:  
a chain forming a closed loop and positioned so that rotation of the chain causes the first bale to advance ahead of the second bale by the predetermined distance along the bale receiving axis.

43. An agricultural bale accumulator according to claim 34 wherein the bale handling module further comprises:

a bale stacking module adapted to stack the first bale with respect to the second bale along a bale stacking axis vertically transverse to the bale receiving axis responsive to the bale advancement module stopping the advancement of the first bale onto the load bed along the bale receiving axis to position the first bale and the second bale in a stacked relationship on the load bed.

44. An agricultural bale accumulator according to claim 34 wherein the bale handling module further comprises:

a bale transfer module adapted to transfer at least the first bale across the load bed along a bale transfer axis horizontally transverse to the bale receiving axis responsive to the bale advancement module stopping the advancement of the first bale onto the load bed along the bale

receiving axis to position the first bale and the second bale in a side-by-side relationship on the load bed.

45. A method for operating an agricultural bale accumulator comprising the steps of:

receiving on a load bed a plurality of bales, including a first bale followed by a second bale, at a first rate of speed along a bale receiving axis;

determining that the first bale is located at a first predetermined position on the load bed along the bale receiving axis responsive to the receipt of the first bale on the load bed;

advancing the first bale onto the load bed at a second rate of speed, greater than the first rate of speed, along the bale receiving axis responsive to the determination that the first bale is located at the first predetermined position along the bale receiving axis to advance the first bale ahead of the second bale by a predetermined distance along the bale receiving axis; and

handling the first bale received on the load bed in a first amount of time less than a second amount of time required for the second bale to move through the predetermined distance at the first rate of speed along the bale receiving axis responsive to the advancement of the first bale onto the load bed along the bale receiving axis.

46. A method according to claim 45:

wherein the agricultural bale accumulator is adapted to be pulled in tandem behind an agricultural baler in a direction of travel across a ground surface,

wherein the plurality of bales are ejected from a bale chamber of the agricultural baler at the first rate of speed along the bale receiving axis in a bale traveling direction essentially opposite to the direction of travel,

wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the load bed along the bale receiving axis in the bale traveling direction, and

wherein the first bale is located in the first predetermined position on the load bed along the bale receiving axis responsive to the first bale being completely formed and ejected from the bale chamber of the agricultural baler.

47. A method according to claim 46 wherein the step of determining further comprises the step of:

monitoring the formation of and the ejection of the first bale from the bale chamber of the agricultural baler.

48. A method according to claim 45 further comprises the step of:

adjusting the first predetermined position along the bale receiving axis.

49. A method according to claim 45 further comprising the step of:

determining that the first bale is located in a second predetermined position along the bale receiving axis ahead of the first predetermined position along the bale receiving axis by the predetermined distance responsive to the advancement of the first bale onto the load bed along the bale receiving axis,

5 wherein the step of handling is responsive to the determination that the first bale is located in the second predetermined position.

50. A method according to claim 49 further comprising the step of:  
adjusting the second predetermined position along the bale receiving axis.

10 51. A method according to claim 49:

wherein the step of advancing stops the advancement of the first bale onto the load bed along the bale receiving axis responsive to the determination that the first bale is located in the second predetermined position along the bale receiving axis, and

15 wherein the step of handling is responsive to the bale advancement module stopping the advancement of the first bale onto the load bed along the bale receiving axis.

52. A method according to claim 45 wherein the step of advancing further comprises the steps of:

20 engaging the first bale with a bale engaging mechanism; and  
driving the bale engaging mechanism to advance the first bale ahead of the second bale by the predetermined distance along the bale receiving axis.

53. A method according to claim 45 wherein the step of handling further comprises the step of:  
25 discharging the first bale received on the load bed to a ground surface responsive to at least the first bale being advanced onto the load bed.

54. A method according to claim 53 wherein the step of discharging further comprises the step of:

30 pivoting the load bed from a bale receiving position to a bale discharging position to cause the first bale to be discharged to the ground surface under gravitational force acting on at least the first bale, wherein the load bed assumes a horizontal position relative to a frame supporting the load bed when the load bed is in the bale receiving position, wherein the load bed assumes an inclined position relative to the frame supporting the load bed when the load bed is in the bale  
35 discharging position, and wherein the load bed pivots from the bale receiving position, to the bale discharging position and back to the bale receiving position in the first amount of time less than the second amount of time required for the second bale to move through the predetermined distance along the bale receiving axis at the first rate of speed responsive to the first bale being advanced onto the load bed.

55. A method according to claim 45 wherein the step of handling further comprises the step of:  
vertically displacing the first bale with respect to the second bale along a bale stacking axis  
vertically transverse to the bale receiving axis responsive to the first bale being advanced onto the  
5 load bed along the bale receiving axis to position the first bale and the second bale in a stacked  
relationship on the load bed.

56. A method according to claim 45 wherein the step of handling further comprises the step of:

10 transferring at least the first bale across the load bed along a bale transfer axis horizontally  
transverse to the bale receiving axis responsive to the first bale being advanced onto the load bed  
to position the first bale and the second bale in a side-by-side relationship on the load bed.

57. A method of operating an agricultural bale accumulator adapted to be pulled in tandem  
15 behind an agricultural baler in a direction of travel across a ground surface, the method  
comprising the steps of:

receiving on a load bed a plurality of bales, including a first bale followed by a second  
bale, at a first rate of speed along a bale receiving axis, wherein the plurality of bales are ejected  
from a bale chamber of the agricultural baler at the first rate of speed along the bale receiving axis  
20 in a bale traveling direction essentially opposite to the direction of travel, and wherein the second  
bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to  
cause the first bale to be received on the load bed along the bale receiving axis in the bale traveling  
direction;

determining that the first bale is located a first predetermined position on the load bed  
25 along the bale receiving axis responsive to the receipt of the first bale on the load bed, wherein the  
first bale is located in the first predetermined position on the load bed along the bale receiving axis  
responsive to the first bale being completely formed and ejected from the bale chamber of the  
agricultural baler;

30 advancing the first bale onto the load bed at a second rate of speed, greater than the first  
rate of speed, along the bale receiving axis responsive to the determination that the first bale is  
located in the first predetermined position to advance the first bale ahead of the second bale by a  
predetermined distance along the bale receiving axis; and

35 handling the first bale received on the load bed in a first amount of time less than a second  
amount of time required for the second bale to move through the predetermined distance at the first  
rate of speed along the bale receiving axis responsive to the advancement of the first bale onto the  
load bed along the bale receiving axis, wherein the step of handling further comprises the step of:

discharging the first bale received on the load bed to a ground surface responsive  
to the advancement of the first bale onto the load bed along the bale receiving axis, wherein the  
step of discharging further comprises the step of:

pivoting the load bed from a bale receiving position to a bale discharging position to cause the first bale to be discharged to the ground surface under gravitational force acting on at least the first bale, wherein the load bed assumes a horizontal position relative to a frame supporting the load bed when the load bed is in the bale receiving position, wherein the load bed assumes an inclined position relative to the frame supporting the load bed when the load bed is in the bale discharging position, and wherein the load bed pivots from the bale receiving position, to the bale discharging position and back to the bale receiving position in the first amount of time less than the second amount of time required for the second bale to move through the predetermined distance along the bale receiving axis at the first rate of speed responsive to at least the first bale being advanced onto the load bed.

58. A method according to claim 57 wherein the step of determining further comprises the step of:

monitoring the formation of and the ejection of the first bale from the bale chamber of the agricultural baler.

59. A method according to claim 57 further comprises the step of:

adjusting the first predetermined position along the bale receiving axis.

60. A method according to claim 57 further comprising the step of:

determining that the first bale is located in a second predetermined position along the bale receiving axis ahead of the first predetermined position along the bale receiving axis by the predetermined distance responsive to the advancement of the first bale onto the load bed along the bale receiving axis,

wherein the step of handling is responsive to the determination that the first bale is located in the second predetermined position.

61. A method according to claim 60 further comprising the step of:

adjusting the second predetermined position along the bale receiving axis.

62. A method according to claim 60:

wherein the step of advancing stops the advancement of the first bale onto the load bed along the bale receiving axis responsive to the determination that the first bale is located in the second predetermined position along the bale receiving axis, and

wherein the step of handling is responsive to the bale advancement module stopping the advancement of the first bale onto the load bed along the bale receiving axis.

63. A method according to claim 57 wherein the step of advancing further comprises the steps of:

engaging the first bale with a bale engaging mechanism; and  
driving the bale engaging mechanism to advance the first bale ahead of the second bale by the predetermined distance along the bale receiving axis.

64. A method according to claim 57 wherein the step of handling further comprises the step of:  
vertically displacing the first bale with respect to the second bale along a bale stacking axis  
vertically transverse to the bale receiving axis responsive to the first bale being advanced onto the  
load bed along the bale receiving axis to position the first bale and the second bale in a stacked  
relationship on the load bed.

65. A method according to claim 57 wherein the step of handling further comprises the step of:  
  
transferring at least the first bale across the load bed along a bale transfer axis horizontally  
transverse to the bale receiving axis responsive to the first bale being advanced onto the load bed  
to position the first bale and the second bale in a side-by-side relationship on the load bed.

66. A method of operating an agricultural bale accumulator adapted to be pulled in tandem  
behind an agricultural baler in a direction of travel across a ground surface, the method  
comprising the steps of:

receiving on a load bed a plurality of bales, including a first bale followed by a second  
bale, at a first rate of speed along a bale receiving axis, wherein the plurality of bales are ejected  
from a bale chamber of the agricultural baler at the first rate of speed along the bale receiving axis  
in a bale traveling direction essentially opposite to the direction of travel, and wherein the second  
bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to  
cause the first bale to be received on the load bed along the bale receiving axis in the bale traveling  
direction;

determining that the first bale is located a first predetermined position on the load bed  
along the bale receiving axis responsive to the receipt of the first bale on the load bed, wherein the  
first bale is located in the first predetermined position on the load bed along the bale receiving axis  
responsive to the first bale being completely formed and ejected from the bale chamber of the  
agricultural baler;

advancing the first bale onto the load bed at a second rate of speed, greater than the first  
rate of speed, along the bale receiving axis responsive to the determination that the first bale is  
located in the first predetermined position to advance the first bale ahead of the second bale by a  
predetermined distance along the bale receiving axis, wherein the step of advancing further  
comprises the steps of:

engaging the first bale with a bale engaging mechanism; and  
driving the bale engaging mechanism to advance the first bale ahead of the second  
bale by the predetermined distance along the bale receiving axis;

determining that the first bale is located in a second predetermined position along the bale receiving axis ahead of the first predetermined position along the bale receiving axis by the predetermined distance responsive to the advancement of the first bale onto the load bed along the bale receiving axis, wherein the step of advancing is adapted to stop the advancement of the first bale onto the load bed along the bale receiving axis responsive to the determination that the first bale is located in the second predetermined position along the bale receiving axis; and

handling the first bale received on the load bed in a first amount of time less than a second amount of time required for the second bale to move through the predetermined distance at the first rate of speed along the bale receiving axis responsive to the step of advancing stopping the advancement of the first bale onto the load bed along the bale receiving axis, wherein the step of handling further comprises the step of:

discharging the first bale received on the load bed to a ground surface responsive to the step of advancing stopping the advancement of at least the first bale onto the load bed along the bale receiving axis, wherein the step of discharging further comprises the step of:

pivoting the load bed from a bale receiving position to a bale discharging position to cause the first bale to be discharged to the ground surface under gravitational force acting on at least the first bale, wherein the load bed assumes a horizontal position relative to a frame supporting the load bed when the load bed is in the bale receiving position, wherein the load bed assumes an inclined position relative to the frame supporting the load bed when the load bed is in the bale discharging position, and wherein the load bed pivots from the bale receiving position, to the bale discharging position and back to the bale receiving position in the first amount of time less than the second amount of time required for the second bale to move through the predetermined distance along the bale receiving axis at the first rate of speed responsive to at least the first bale being advanced onto the load bed.

67. A method according to claim 66 wherein the step of determining that the first bale is located a first predetermined position on the load bed along the bale receiving axis further comprises the step of:

monitoring the formation of and the ejection of the first bale from the bale chamber of the agricultural baler.

68. A method according to claim 66 further comprises the step of:  
adjusting the first predetermined position along the bale receiving axis.

69. A method according to claim 66 further comprising the step of:  
adjusting the second predetermined position along the bale receiving axis.

70. A method according to claim 66 wherein the step of handling further comprises the step of:  
vertically displacing the first bale with respect to the second bale along a bale stacking axis  
vertically transverse to the bale receiving axis responsive to the step of advancing stopping the

advancement of the first bale onto the load bed along the bale receiving axis to position the first bale and the second bale in a stacked relationship on the load bed.

71. A method according to claim 66 wherein the step of handling further comprises the step of:  
5 transferring at least the first bale across the load bed along a bale transfer axis horizontally transverse to the bale receiving axis responsive to the step of advancing stopping the advancement of the first bale onto the load bed along the bale receiving axis to position the first bale and the second bale in a side-by-side relationship on the load bed.

10 Bale Arrangement Control Module:

1. A method for operating an agricultural bale accumulator comprising the steps of:  
receiving an input condition;  
receiving a plurality of bales on the agricultural bale accumulator;  
15 determining a dynamic arrangement for the plurality of bales received on the agricultural bale accumulator responsive to the input condition; and  
accumulating the plurality of bales received on the agricultural bale accumulator responsive to the dynamic arrangement.

20 2. A method according to claim 1 wherein the input condition is determined before the step of accumulating.

3. A method according to claim 1 wherein the input condition is determined during the step of accumulating.

25 4. A method according to claim 1 wherein the input condition further comprises a condition of the agricultural bale accumulator.

30 5. A method according to claim 4 wherein the condition of the agricultural bale accumulator further comprises a bale carrying capacity of the agricultural bale accumulator.

6. A method according to claim 5  
wherein the agricultural bale accumulator includes a base module adapted to be supported by and transported across a ground surface, wherein the base module includes a load bed being  
35 substantially planar adapted to receive thereon the plurality of bales along a bale receiving axis, wherein the load bed has a first side disposed essentially opposite to and essentially parallel to a second side of the load bed, wherein the agricultural bale accumulator includes a bale transfer module adapted to transfer the plurality of bales across the load bed along a bale transfer axis horizontally transverse to the bale receiving axis responsive to the plurality of bales being received  
40 on the load bed to accumulate the plurality of bales on the load bed as the agricultural bale



accumulator is transported across the ground surface, wherein the agricultural bale accumulator includes at least a first extension table which is substantially planar and coupled to the first side of the load bed, wherein the first extension table is moveable relative to the base module between a stowed position and an unstowed position, and

5 wherein the bale carrying capacity of the agricultural bale accumulator is responsive to the first extension table being in one of the stowed position and the unstowed position, wherein the agricultural bale accumulator has a first bale carrying capacity when the first extension table is in the stowed position by not permitting at least one bale of the plurality of bales to be received on the first extension table, and wherein the agricultural bale accumulator has a second bale carrying  
10 capacity, greater than the first bale carrying capacity, when the first extension table is in the unstowed position by permitting at least one bale of the plurality of bales to be received on the first extension table.

7. A method according to claim 5 wherein the condition of the agricultural bale accumulator includes a base module adapted to be supported by and transported across a ground surface, wherein the ground surface has a degree of levelness, relative to a horizontal plane, which varies across the ground surface, wherein the base module includes a load bed being substantially planar and having a measure of levelness, relative to the horizontal plane, which varies in accordance with the degree of levelness as the agricultural bale accumulator is transported across the ground  
15 surface, wherein the load bed is adapted to receive thereon the plurality of bales along a bale receiving axis and is adapted to accumulate thereon the plurality of bales on the load bed as the agricultural bale accumulator is transported across the ground surface, and

20 wherein the input condition is responsive to the measure of levelness of the load bed relative to the horizontal plane.

25 8. A method according to claim 1 wherein the input condition further comprises a condition of each of the plurality of bales.

9. A method according to claim 8 wherein the condition of each of the plurality of bales  
30 further comprises a weight of each of the plurality of bales.

10. A method according to claim 8 wherein the condition of each of the plurality of bales further comprises at least one of a length, a width and a height of each of the plurality of bales.

35 11. A method according to claim 1 wherein the input condition further comprises an input signal representative of a location of the agricultural bale accumulator in a field in which the agricultural bale accumulator is accumulating the plurality of bales.

40 12. A method according to claim 11 wherein the input condition further comprises at least one predetermined bale discharge zone in the field.

13. A method according to claim 1 wherein the input condition further comprises a bale carrying capacity of a bale hauling truck which is adapted to haul the plurality of bales accumulated by the agricultural bale accumulator to a remote site.

14. A method according to claim 1 wherein the input condition further comprises a bale carrying capacity of a remote site adapted to the plurality of bales accumulated by the agricultural bale accumulator.

15. A method according to claim 1 wherein the input condition further comprises a manual input signal provided by an operator of the agricultural bale accumulator.

16. A method according to claim 1 wherein the agricultural bale accumulator includes a base module adapted to be supported by and transported across a ground surface, wherein the base module includes a load bed being substantially planar adapted to receive thereon the plurality of bales along a bale receiving axis, wherein the step of accumulating further comprises the step of:

transferring the plurality of bales across the load bed along a bale transfer axis horizontally transverse to the bale receiving axis responsive to the plurality of bales being received on the load bed and responsive to the determined dynamic arrangement to permit the agricultural bale accumulator to accumulate the plurality of bales on the load bed.

17. A method according to claim 1 wherein the agricultural bale accumulator includes a base module adapted to be supported by and transported across a ground surface, wherein the base module includes a load bed being substantially planar adapted to receive thereon the plurality of bales along a bale receiving axis, wherein the step of accumulating further comprises the step of:

forming at least one stack of bales, having at least two bales, along a bale stacking axis vertically transverse to the bale receiving axis responsive to receiving the plurality of bales on the load bed and responsive to the determined dynamic arrangement to permit the agricultural bale accumulator to accumulate the at least one stack of bales on the load bed.

18. A method for operating an agricultural bale accumulator including a base module adapted to be supported by and transported across a ground surface, wherein the base module includes a load bed being substantially planar adapted to receive thereon the plurality of bales along a bale receiving axis, the method comprising the steps of:

receiving an input condition;

receiving a plurality of bales on the load bed;

determining a dynamic arrangement for the plurality of bales received on the load bed responsive to the input condition, wherein the dynamic arrangement is a matrix arrangement represented by a first number of bales of the plurality of bales disposed along a bale transfer axis horizontally transverse to the bale receiving axis and by a second number of bales of the plurality

of bales disposed along a bale stacking axis vertically transverse to the bale receiving axis and the bale transfer axis; and

accumulating the plurality of bales received on the load bed responsive to the dynamic arrangement, wherein the step of accumulating further comprises the steps of:

5           forming at least one stack of bales, having at least two bales, along the bale stacking axis responsive to receiving the plurality of bales on the load bed and responsive to the determined dynamic arrangement to permit the agricultural bale accumulator to accumulate the at least one stack of bales on the load bed; and

10           transferring the at least one stack of bales across the load bed along the bale transfer axis responsive to the at least one stack of bales being formed on the load bed and responsive to the determined dynamic arrangement to permit the agricultural bale accumulator to accumulate the plurality of bales on the load bed.

15           19. A method according to claim 18 wherein the input condition is determined before the step of accumulating.

20           20. A method according to claim 18 wherein the input condition is determined during the step of accumulating.

25           21. A method according to claim 18 wherein the input condition further comprises a condition of the agricultural bale accumulator.

            22. A method according to claim 21 wherein the condition of the agricultural bale accumulator further comprises a bale carrying capacity of the agricultural bale accumulator.

            23. A method according to claim 22:  
                wherein the load bed has a first side disposed essentially opposite to and essentially parallel to a second side of the load bed, wherein the agricultural bale accumulator includes at least a first extension table which is substantially planar and coupled to the first side of the load bed,  
30           wherein the first extension table is moveable relative to the base module between a stowed position and an unstowed position, and

                wherein the bale carrying capacity of the agricultural bale accumulator is responsive to the first extension table being in one of the stowed position and the unstowed position, wherein the agricultural bale accumulator has a first bale carrying capacity when the first extension table is in  
35           the stowed position by not permitting at least one bale of the plurality of bales to be received on the first extension table, and wherein the agricultural bale accumulator has a second bale carrying capacity, greater than the first bale carrying capacity, when the first extension table is in the unstowed position by permitting at least one bale of the plurality of bales to be received on the first extension table.

24. A method according to claim 22 wherein the ground surface has a degree of levelness, relative to a horizontal plane, which varies across the ground surface, wherein the load bed being has a measure of levelness, relative to the horizontal plane, which varies in accordance with the degree of levelness as the agricultural bale accumulator is transported across the ground surface, and

wherein the input condition is responsive to the measure of levelness of the load bed relative to the horizontal plane.

25. A method according to claim 18 wherein the input condition further comprises a condition of each of the plurality of bales.

26. A method according to claim 25 wherein the condition of each of the plurality of bales further comprises a weight of each of the plurality of bales.

27. A method according to claim 25 wherein the condition of each of the plurality of bales further comprises at least one of a length, a width and a height of each of the plurality of bales.

28. A method according to claim 18 wherein the input condition further comprises an input signal representative of a location of the agricultural bale accumulator in a field in which the agricultural bale accumulator is accumulating the plurality of bales.

29. A method according to claim 28 wherein the input condition further comprises at least one predetermined bale discharge zone in the field.

30. A method according to claim 18 wherein the input condition further comprises a bale carrying capacity of a bale hauling truck which is adapted to haul the plurality of bales accumulated by the agricultural bale accumulator to a remote site.

31. A method according to claim 18 wherein the input condition further comprises a bale carrying capacity of a remote site adapted to the plurality of bales accumulated by the agricultural bale accumulator.

32. A method according to claim 18 wherein the input condition further comprises a manual input signal provided by an operator of the agricultural bale accumulator.

1. An agricultural bale accumulator comprising:

a base module including a load bed adapted to receive and accumulate thereon a plurality of bales, wherein each bale of the plurality of bales has a size and a weight, wherein the load bed has

a predetermined bale load capacity responsive to at least one of the size and weight of each bale of the plurality of bales;

a bale accumulation control module adapted to determine a bale accumulation arrangement of a plurality of bale accumulation arrangements of the plurality of bales on the load bed responsive to the predetermined bale load capacity of the load bed; and

a bale accumulation arrangement module adapted to accumulate the plurality of bales on the load bed responsive to the bale accumulation arrangement.

2. An agricultural bale accumulator according to claim 1:

wherein the agricultural bale accumulator is adapted to be pulled in tandem behind an agricultural baler in an accumulator traveling direction across the ground surface,

wherein the plurality of bales, including a first bale followed by a second bale, are successively ejected from a bale chamber of the agricultural baler at the first rate of speed along the bale receiving axis in the bale receiving direction essentially opposite to the accumulator traveling direction,

wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the load bed along the bale receiving axis in the bale traveling direction, and

wherein each of the plurality of bales are received on the load bed along the bale receiving axis to accumulate thereon each of the plurality of bales responsive to each of the plurality of bales being completely formed and ejected from the bale chamber of the agricultural baler.

3. An agricultural bale accumulator according to claim 1 wherein the bale accumulation arrangement module further comprises:

a bale transfer module adapted to distribute each of the plurality of bales received on the load bed across the load bed along a bale distributing axis horizontally traverse to a bale receiving axis along which the plurality of bales are received to position the plurality of bales received on the load bed in a side-by-side relationship on the load bed to accumulate the plurality of bales on the load bed.

4. An agricultural bale accumulator according to claim 1 wherein the bale accumulation arrangement module further comprises:

a bale stacking module adapted to stack the plurality of bales along a bale stacking axis vertically transverse to a bale receiving axis along which the plurality of bales are received responsive to the first bale being advanced onto the load bed along the bale receiving path to position the first bale and the second bale in a stacked relationship on the load bed.

5. An agricultural bale accumulator according to claim 1 further comprising:

a bale discharge module adapted to discharge the plurality of bales accumulated on the load bed to a ground surface responsive to the plurality of bales being accumulated on the load bed.

6. An agricultural bale accumulator according to claim 5 wherein the bale discharge module further comprises:

5 a pivot mechanism adapted to pivot the load bed from a bale receiving position to a bale discharging position to cause the first bale to be discharged to the ground surface under gravitational force acting on at least the first bale, wherein the load bed assumes a horizontal position relative to a frame supporting the load bed when the load bed is in the bale receiving position, and wherein the load bed assumes an inclined position relative to the frame supporting the load bed when the load bed is in the bale discharging position.

10 7. An agricultural bale accumulator according to claim 1:

wherein the plurality of bales accumulated on the load bed are adapted to be transferred from the load bed to a transport bed of a transport vehicle which is adapted to transport the plurality of bales transferred thereto to a remote site, and wherein the transport bed has a predetermined bale load capacity responsive to at least one of the size and weight of each bale of the plurality of bales transferred thereto, and

15 wherein the bale accumulation control module is further adapted to determine the bale accumulation arrangement responsive to the predetermined bale load capacity of the transport bed.

20 8. An agricultural bale accumulator according to claim 1 further comprising:

an operator input device adapted to receive the bale accumulation arrangement from an operator of the agricultural bale accumulator,

25 wherein the bale accumulation control module determines the bale accumulation arrangement responsive to the bale accumulation arrangement from the operator of the agricultural bale accumulator.

9. An agricultural bale accumulator according to claim 1 further comprising:

a global positioning satellite receiver adapted to determine a position of the agricultural bale accumulator on a ground surface of an earth,

30 wherein the bale accumulation control module determines the bale accumulation arrangement responsive to the position of the agricultural bale accumulator on the ground surface of the earth.

10. An agricultural bale accumulator according to claim 9 further comprising:

35 a bale discharge module adapted to discharge the plurality of bales accumulated on the load bed to the ground surface of the earth responsive to the position of the agricultural bale accumulator on the ground surface of the earth.

40 11. An agricultural bale accumulator according to claim 10 wherein the position of the agricultural bale accumulator on the ground surface of the earth at which the plurality of bales are

discharged corresponds to convenient locations on the ground surface of the earth to pick up the plurality of bales from the ground surface of the earth for transporting to a remote site.

12. A method according to claim 1 further comprising the steps of:

- 5       determining a location of the agricultural bale accumulator on a surface of the earth; and  
       determining at least one location on the surface of the earth for discharging the plurality of accumulated bales on the load bed;

      wherein the step of determining an arrangement is responsive to the step of determining a location of the agricultural bale accumulator on a surface of the earth and responsive to the step of  
 10       determining the at least one location on the surface of the earth for discharging the plurality of accumulated bales on the load bed.

#### Bale Stabilization Module

1. An agricultural bale accumulator comprising:

a base module adapted to be supported by and transported across a ground surface, wherein the ground surface has a degree of levelness, relative to a horizontal plane, which varies across the ground surface, the base module including:

20       a load bed being substantially planar and having a measure of levelness, relative to the horizontal plane, which varies in accordance with the degree of levelness as the agricultural bale accumulator is transported across the ground surface, wherein the load bed is adapted to receive thereon a plurality of bales along a bale receiving axis and is adapted to accumulate thereon the plurality of bales at predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, and wherein an undesirable amount of the  
 25       measure of levelness encourages the plurality of bales located at the predetermined positions on the load bed to move from the predetermined positions as the agricultural bale accumulator is transported across the ground surface; and

30       a bale stabilization module adapted to encourage the plurality of bales accumulated on the load bed located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface.

2. An agricultural bale accumulator according to claim 1 wherein the bale stabilization module further comprises:

35       a load bed leveling module including:

      a level determining device adapted to determine the measure of levelness of the load bed relative to the horizontal plane as the agricultural bale accumulator is transported across the ground surface; and

40       a level controlling device adapted to change a leveling position, within a predetermined range of leveling positions, of the load bed relative to the horizontal plane

responsive to the measure of levelness to compensate for the degree of levelness of the ground surface relative to the horizontal plane thereby encouraging the plurality of bales accumulated on the load bed located at the predetermined positions to remain located at the predetermined positions as the agricultural bale accumulator is transported across the ground surface.

3. An agricultural bale accumulator according to claim 2:

wherein the level controlling device positions the load bed at an intermediate leveling position between a minimum leveling position and a maximum leveling position of the predetermined range of leveling positions when the ground surface and the load bed are substantially level with the horizontal plane to permit the level controlling device to change the leveling position, within the predetermined range of leveling positions, of portions of the load bed in either a positive direction or a negative direction relative to the horizontal plane responsive to the measure of levelness.

4. An agricultural bale accumulator according to claim 2:

wherein the load bed has a longitudinal axis disposed substantially parallel to the bale receiving axis,

wherein the level determining device further comprises:

a longitudinal level determining device adapted to determine a first measure of levelness of the load bed along the longitudinal axis relative the horizontal plane as the agricultural bale accumulator is transported across the ground surface; and

wherein the level controlling device further comprises:

a longitudinal level controlling device adapted to change the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness to compensate for the degree of levelness of the ground surface along the longitudinal axis relative to the horizontal plane thereby encouraging the plurality of bales accumulated on the load bed located at the predetermined positions to remain located at the predetermined positions as the agricultural bale accumulator is transported across the ground surface.

5. An agricultural bale accumulator according to claim 4 wherein the longitudinal level controlling device is adapted to change the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative the horizontal plane when the first measure of levelness is undesirable and is adapted to not change the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative the horizontal plane when the first measure of levelness is desirable.

6. An agricultural bale accumulator according to claim 4:

wherein the base module further comprises:



a frame mechanically coupled to the load bed and adapted to support the load bed above the ground surface, wherein the load bed has a lateral axis disposed substantially perpendicular to the longitudinal axis, wherein the load bed is mechanically coupled to the frame about a pivot axis disposed substantially parallel to the lateral axis, and

wherein the longitudinal level controlling device further comprises:

a first longitudinal level controlling device mechanically coupled to the frame and the load bed and adapted to pivot the load bed about the pivot axis responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

7. An agricultural bale accumulator according to claim 6:

wherein the frame has a forward end portion and a rear end portion disposed along the longitudinal axis as referenced to a forward traveling direction of the agricultural bale accumulator, wherein the load bed is mechanically coupled to the frame about the pivot axis at the rear end portion of the frame between a forward end portion of the load bed and a rear end portion of the load bed as referenced to the forward traveling direction of the agricultural bale accumulator, and wherein the forward end portion of the frame is disposed closer to the ground than the rear end portion of the frame as the agricultural bale accumulator is transported across the ground surface to permit the frame to be disposed at an acute angle relative to the ground surface with a closed end of the acute angle leading an open end of the acute angle as the agricultural bale accumulator is transported across the ground surface, and

wherein the level controlling device positions the load bed at an intermediate leveling position between a minimum leveling position and a maximum leveling position of the predetermined range of leveling positions when the ground surface and the load bed are substantially level with the horizontal plane to permit the first longitudinal level controlling device to pivot the forward end portion of the load bed about the pivot axis in either a positive direction or a negative direction relative to the horizontal plane in correspondence with the rear end portion of the load bed being pivoted about the pivot axis in either the negative direction or the positive direction, respectively, relative to the horizontal plane, responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

8. An agricultural bale accumulator according to claim 6 wherein first longitudinal level controlling device is further adapted to pivot the load bed about the pivot axis between a bale receiving position and a bale discharging position relative to the frame, wherein the load bed assumes the leveling position, within the predetermined range of leveling positions, when the load bed is in the bale receiving position to permit the load bed to receive and accumulate thereon the plurality of bales, and wherein the load bed assumes an inclined position relative to the frame

when the load bed is in the bale discharging position to permit the plurality of bales to be discharged from the load bed to the ground surface under a gravitational force acting on the plurality of bales.

9. An agricultural bale accumulator according to claim 4:

wherein the base module further comprises:

a frame mechanically coupled to the load bed and adapted to support the load bed above the ground surface, wherein a forward end portion of the frame, as referenced to a forward traveling direction of the agricultural bale accumulator, is adapted to be mechanically coupled to a hitch on towing unit to permit the agricultural bale accumulator to be pulled in tandem behind the towing unit, and

wherein the longitudinal level controlling device further comprises:

a second longitudinal level controlling device mechanically coupled to the forward end portion of the frame and adapted to change a frame leveling position, within a predetermined range of frame leveling positions, of the forward end portion of the frame relative to the hitch responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

10. An agricultural bale accumulator according to claim 9:

wherein the second longitudinal level controlling device positions the load bed at an intermediate frame leveling position between a minimum frame leveling position and a maximum frame leveling position of the predetermined range of leveling positions when the ground surface and the load bed are substantially level with the horizontal plane to permit the second longitudinal level controlling device to change the frame leveling position, within the predetermined range of frame leveling positions, of portions of the frame in either a positive direction or a negative direction relative to the horizontal plane responsive to the first measure of levelness.

11. An agricultural bale accumulator according to claim 2:

wherein the load bed has a lateral axis disposed substantially perpendicular to the bale receiving axis,

wherein the level determining device further comprises:

a lateral level determining device adapted to determine a second measure of levelness of the load bed along the lateral axis relative the horizontal plane as the agricultural bale accumulator is transported across the ground surface; and

wherein the level controlling device further comprises:

a lateral level controlling device adapted to change the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness to compensate for the degree of levelness of the ground surface along the lateral axis relative to the horizontal plane thereby

encouraging the plurality of bales accumulated on the load bed located at the predetermined positions to remain located at the predetermined positions as the agricultural bale accumulator is transported across the ground surface.

5 12. An agricultural bale accumulator according to claim 11 wherein the lateral level controlling device is adapted to change the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative the horizontal plane when the second measure of levelness is undesirable and is adapted to not change the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative the  
10 horizontal plane when the second measure of levelness is desirable.

13. An agricultural bale accumulator according to claim 11:  
wherein the base module further comprises:

a frame mechanically coupled to the load bed and adapted to support the load bed  
15 above the ground surface; and

a first wheel and a second wheel mechanically coupled to first and second opposite sides of the frame, respectively, along a wheel axis disposed substantially parallel to the lateral axis, adapted to support the frame above the ground surface, and adapted to permit the agricultural bale accumulator to be transported across the ground surface, and

20 wherein the lateral level controlling device further comprises:

a first lateral level controlling device mechanically coupled between the first side of the frame and the first support wheel and adapted to change a frame leveling position, within a predetermined range of frame leveling positions, of the first side of the frame relative to the first support wheel responsive to the second measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness; and  
25

a second lateral level controlling device mechanically coupled between the second side of the frame and the second support wheel and adapted to change the frame leveling position, within the predetermined range of the frame leveling positions, of the second side of the frame relative to the second support wheel responsive to the second measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness.  
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35 14. An agricultural bale accumulator according to claim 13:

wherein the first lateral level controlling device positions the first side of the frame at a first intermediate frame leveling position between a first minimum frame leveling position and a first maximum leveling frame position of the predetermined range of frame leveling positions when the ground surface and the frame are substantially level with the horizontal plane along the lateral axis  
40 to permit the first lateral level controlling device to change the frame leveling position, within the

predetermined range of frame leveling positions, the first side of the frame in either a positive direction or a negative direction relative to the horizontal plane responsive to the first measure of levelness,

wherein the second lateral level controlling device positions the second side of the frame at a second intermediate frame leveling position between a second minimum frame leveling position and a second maximum leveling frame position of the predetermined range of frame leveling positions when the ground surface and the frame are substantially level with the horizontal plane along the lateral axis to permit the second lateral level controlling device to change the frame leveling position, within the predetermined range of frame leveling positions, the second side of the frame in either a positive direction or a negative direction relative to the horizontal plane responsive to the second measure of levelness, and

wherein the first side of the frame and the second side of the frame are substantially level with the horizontal plane along the lateral axis when the first lateral level controlling device positions the first side of the frame at the first intermediate frame leveling position and when the second lateral level controlling device positions the second side of the frame at the second intermediate frame leveling position to permit the load bed to be substantially level with the horizontal plane along the lateral axis.

15. An agricultural bale accumulator according to claim 2:

wherein the agricultural bale accumulator is adapted to be mechanically coupled to an agricultural baler to permit the agricultural bale accumulator to be pulled in tandem behind the agricultural baler, wherein the plurality of bales are successively ejected from a bale chamber of the agricultural baler and are successively received on the load bed at a bale entry region along the bale receiving axis, and

wherein the agricultural bale accumulator further comprises:

a bale support bridge adapted to be mechanically coupled to the load bed at a bale entry region and to the bale chamber of the agricultural baler along the bale receiving axis, wherein bale support bridge is adapted to support and guide the plurality of bales as the plurality of bales move along the bale receiving axis from the bale chamber of the agricultural baler to the load bed at the bale entry region while the level controlling device changes the leveling position, within the predetermined range of leveling positions, of the load bed relative to the horizontal plane responsive to the measure of levelness.

16. An agricultural bale accumulator according to claim 2 wherein at least one of the level determining device and the level controlling device of the load bed leveling module is attachable to and detachable from the agricultural bale accumulator independently of any other module on the agricultural bale accumulator.

17. An agricultural bale accumulator according to claim 2 further comprising:

a bale transfer module adapted to transfer the plurality of bales across the load bed along a bale transferring axis disposed horizontally traverse to the bale receiving axis responsive to receiving the plurality of bales on the load bed to permit the agricultural bale accumulator to accumulate the plurality of bales in a side-by-side relationship on the load bed.

5 18. An agricultural bale accumulator according to claim 2 further comprising:

a bale stacking module adapted to form at least one stack of bales, having at least two bales, along a bale stacking axis disposed vertically transverse to the bale receiving axis responsive to receiving the plurality of bales on the load bed to permit the agricultural bale accumulator to accumulate the at least one stack of bales on the load bed.

10 19. An agricultural bale accumulator comprising:

a base module adapted to be supported by and transported across a ground surface, wherein the ground surface has a degree of levelness, relative to a horizontal plane, which varies across the ground surface, the base module including:

15 a load bed being substantially planar and having a measure of levelness, relative to the horizontal plane, which varies in accordance with the degree of levelness as the agricultural bale accumulator is transported across the ground surface, wherein the load bed is adapted to receive thereon a plurality of bales along a bale receiving axis and is adapted to accumulate thereon the plurality of bales at predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, wherein an undesirable amount of the measure of levelness encourages the plurality of bales located at the predetermined positions on the load bed to move from the predetermined positions as the agricultural bale accumulator is transported across the ground surface, and wherein the load bed has a longitudinal axis disposed substantially parallel with the bale receiving axis and a lateral axis disposed substantially perpendicular to the longitudinal axis; and

20 a load bed leveling module including:

25 a level determining device adapted to determine the measure of levelness of the load bed relative to the horizontal plane as the agricultural bale accumulator is transported across the ground surface, wherein the level determining device further comprises:

30 a longitudinal level determining device adapted to determine a first measure of levelness of the load bed along the longitudinal axis relative the horizontal plane as the agricultural bale accumulator is transported across the ground surface; and

35 a lateral level determining device adapted to determine a second measure of levelness of the load bed along the lateral axis relative the horizontal plane as the agricultural bale accumulator is transported across the ground surface; and

40 a level controlling device adapted to change a leveling position, within a predetermined range of leveling positions, of the load bed relative to the horizontal plane responsive to the measure of levelness to compensate for the degree of levelness of the ground surface relative to the horizontal plane thereby encouraging the plurality of bales accumulated on

the load bed located at the predetermined positions to remain located at the predetermined positions as the agricultural bale accumulator is transported across the ground surface, wherein the level controlling device further comprises:

a longitudinal level controlling device adapted to change the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness to compensate for the degree of levelness of the ground surface along the longitudinal axis relative to the horizontal plane thereby encouraging the plurality of bales accumulated on the load bed located at the predetermined positions to remain located at the predetermined positions as the agricultural bale accumulator is transported across the ground surface; and

a lateral level controlling device adapted to change the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness to compensate for the degree of levelness of the ground surface along the lateral axis relative to the horizontal plane thereby encouraging the plurality of bales accumulated on the load bed located at the predetermined positions to remain located at the predetermined positions as the agricultural bale accumulator is transported across the ground surface.

20. An agricultural bale accumulator according to claim 19:

wherein the level controlling device positions the load bed at an intermediate leveling position between a minimum leveling position and a maximum leveling position of the predetermined range of leveling positions when the ground surface and the load bed are substantially level with the horizontal plane to permit the level controlling device to change the leveling position, within the predetermined range of leveling positions, of portions of the load bed in either a positive direction or a negative direction relative to the horizontal plane responsive to the measure of levelness.

21. An agricultural bale accumulator according to claim 19 wherein the longitudinal level controlling device is adapted to change the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative the horizontal plane when the first measure of levelness is undesirable and is adapted to not change the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative the horizontal plane when the first measure of levelness is desirable.

22. An agricultural bale accumulator according to claim 19:  
wherein the base module further comprises:

a frame mechanically coupled to the load bed and adapted to support the load bed above the ground surface, wherein the load bed is mechanically coupled to the frame about a pivot axis disposed substantially parallel to the lateral axis, and

wherein the longitudinal level controlling device further comprises:

a first longitudinal level controlling device mechanically coupled to the frame and the load bed and adapted to pivot the load bed about the pivot axis responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

23. An agricultural bale accumulator according to claim 22:

wherein the frame has a forward end portion and a rear end portion disposed along the longitudinal axis as referenced to a forward traveling direction of the agricultural bale accumulator, wherein the load bed is mechanically coupled to the frame about the pivot axis at the rear end portion of the frame between a forward end portion of the load bed and a rear end portion of the load bed as referenced to the forward traveling direction of the agricultural bale accumulator, and wherein the forward end portion of the frame is disposed closer to the ground than the rear end portion of the frame as the agricultural bale accumulator is transported across the ground surface to permit the frame to be disposed at an acute angle relative to the ground surface with a closed end of the acute angle leading an open end of the acute angle as the agricultural bale accumulator is transported across the ground surface, and

wherein the level controlling device positions the load bed at an intermediate leveling position between a minimum leveling position and a maximum leveling position of the predetermined range of leveling positions when the ground surface and the load bed are substantially level with the horizontal plane to permit the first longitudinal level controlling device to pivot the forward end portion of the load bed about the pivot axis in either a positive direction or a negative direction relative to the horizontal plane in correspondence with the rear end portion of the load bed being pivoted about the pivot axis in either the negative direction or the positive direction, respectively, relative to the horizontal plane, responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

24. An agricultural bale accumulator according to claim 22 wherein first longitudinal level controlling device is further adapted to pivot the load bed about the pivot axis between a bale receiving position and a bale discharging position relative to the frame, wherein the load bed assumes the leveling position, within the predetermined range of leveling positions, when the load bed is in the bale receiving position to permit the load bed to receive and accumulate thereon the plurality of bales, and wherein the load bed assumes an inclined position relative to the frame when the load bed is in the bale discharging position to permit the plurality of bales to be discharged from the load bed to the ground surface under a gravitational force acting on the plurality of bales.

25. An agricultural bale accumulator according to claim 19:  
wherein the base module further comprises:

5 a frame mechanically coupled to the load bed and adapted to support the load bed above the ground surface, wherein a forward end portion of the frame, as referenced to a forward traveling direction of the agricultural bale accumulator, is adapted to be mechanically coupled to a hitch on towing unit to permit the agricultural bale accumulator to be pulled in tandem behind the towing unit, and

wherein the longitudinal level controlling device further comprises:

10 a second longitudinal level controlling device mechanically coupled to the forward end portion of the frame and adapted to change a frame leveling position, within a predetermined range of frame leveling positions, of the forward end portion of the frame relative to the hitch responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

26. An agricultural bale accumulator according to claim 22:

wherein the second longitudinal level controlling device positions the load bed at an intermediate frame leveling position between a minimum frame leveling position and a maximum frame leveling position of the predetermined range of leveling positions when the ground surface and the load bed are substantially level with the horizontal plane to permit the second longitudinal level controlling device to change the frame leveling position, within the predetermined range of frame leveling positions, of portions of the frame in either a positive direction or a negative direction relative to the horizontal plane responsive to the first measure of levelness.

27. An agricultural bale accumulator according to claim 19 wherein the lateral level controlling device is adapted to change the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative the horizontal plane when the second measure of levelness is undesirable and is adapted to not change the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative the horizontal plane when the second measure of levelness is desirable.

28. An agricultural bale accumulator according to claim 19:  
wherein the base module further comprises:

35 a frame mechanically coupled to the load bed and adapted to support the load bed above the ground surface; and

a first wheel and a second wheel mechanically coupled to first and second opposite sides of the frame, respectively, along a wheel axis disposed substantially parallel to the lateral axis, adapted to support the frame above the ground surface, and adapted to permit the agricultural bale accumulator to be transported across the ground surface, and



wherein the lateral level controlling device further comprises:

a first lateral level controlling device mechanically coupled between the first side of the frame and the first support wheel and adapted to change a frame leveling position, within a predetermined range of frame leveling positions, of the first side of the frame relative to the first support wheel responsive to the second measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness; and

a second lateral level controlling device mechanically coupled between the second side of the frame and the second support wheel and adapted to change the frame leveling position, within the predetermined range of the frame leveling positions, of the second side of the frame relative to the second support wheel responsive to the second measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness.

29. An agricultural bale accumulator according to claim 28:

wherein the first lateral level controlling device positions the first side of the frame at a first intermediate frame leveling position between a first minimum frame leveling position and a first maximum leveling frame position of the predetermined range of frame leveling positions when the ground surface and the frame are substantially level with the horizontal plane along the lateral axis to permit the first lateral level controlling device to change the frame leveling position, within the predetermined range of frame leveling positions, the first side of the frame in either a positive direction or a negative direction relative to the horizontal plane responsive to the first measure of levelness,

wherein the second lateral level controlling device positions the second side of the frame at a second intermediate frame leveling position between a second minimum frame leveling position and a second maximum leveling frame position of the predetermined range of frame leveling positions when the ground surface and the frame are substantially level with the horizontal plane along the lateral axis to permit the second lateral level controlling device to change the frame leveling position, within the predetermined range of frame leveling positions, the second side of the frame in either a positive direction or a negative direction relative to the horizontal plane responsive to the second measure of levelness, and

wherein the first side of the frame and the second side of the frame are substantially level with the horizontal plane along the lateral axis when the first lateral level controlling device positions the first side of the frame at the first intermediate frame leveling position and when the second lateral level controlling device positions the second side of the frame at the second intermediate frame leveling position to permit the load bed to be substantially level with the horizontal plane along the lateral axis.

30. An agricultural bale accumulator according to claim 19:

wherein the agricultural bale accumulator is adapted to be mechanically coupled to an agricultural baler to permit the agricultural bale accumulator to be pulled in tandem behind the agricultural baler, wherein the plurality of bales are successively ejected from a bale chamber of the agricultural baler and are successively received on the load bed at a bale entry region along the bale receiving axis, and

wherein the agricultural bale accumulator further comprises:

a bale support bridge adapted to be mechanically coupled to the load bed at a bale entry region and to the bale chamber of the agricultural baler along the bale receiving axis, wherein the bale support bridge is adapted to support and guide the plurality of bales as the plurality of bales move along the bale receiving axis from the bale chamber of the agricultural baler to the load bed at the bale entry region while the level controlling device changes the leveling position, within the predetermined range of leveling positions, of the load bed relative to the horizontal plane responsive to the measure of levelness.

31. An agricultural bale accumulator according to claim 19 wherein at least one of any portion of the level determining device and any portion of the level controlling device of the load bed leveling module is attachable to and detachable from the agricultural bale accumulator independently of any other module on the agricultural bale accumulator.

32. An agricultural bale accumulator according to claim 19 further comprising:

a bale transfer module adapted to transfer the plurality of bales across the load bed along a bale transferring axis disposed horizontally transverse to the bale receiving axis responsive to receiving the plurality of bales on the load bed to permit the agricultural bale accumulator to accumulate the plurality of bales in a side-by-side relationship on the load bed.

33. An agricultural bale accumulator according to claim 19 further comprising:

a bale stacking module adapted to form at least one stack of bales, having at least two bales, along a bale stacking axis disposed vertically transverse to the bale receiving axis responsive to receiving the plurality of bales on the load bed to permit the agricultural bale accumulator to accumulate the at least one stack of bales on the load bed.

34. An agricultural bale accumulator comprising:

a base module adapted to be supported by and transported across a ground surface, wherein the ground surface has a degree of levelness, relative to a horizontal plane, which varies across the ground surface, the base module including:

a load bed being substantially planar and having a measure of levelness, relative to the horizontal plane, which varies in accordance with the degree of levelness as the agricultural bale accumulator is transported across the ground surface, wherein the load bed is adapted to receive thereon a plurality of bales along a bale receiving axis and is adapted to accumulate thereon

the plurality of bales at predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, wherein an undesirable amount of the measure of levelness encourages the plurality of bales located at the predetermined positions on the load bed to move from the predetermined positions as the agricultural bale accumulator is transported across the ground surface, and wherein the load bed has a longitudinal axis disposed substantially parallel with the bale receiving axis and a lateral axis disposed substantially perpendicular to the longitudinal axis;

a bale stacking module adapted to form at least one stack of bales, having at least two bales, along a bale stacking axis disposed vertically transverse to the bale receiving axis responsive to receiving the plurality of bales on the load bed to permit the agricultural bale accumulator to accumulate the at least one stack of bales on the load bed;

a bale transfer module adapted to transfer the at least one stack of bales on the load bed across the load bed along a bale transferring axis disposed horizontally transverse to the bale receiving axis and the bale stacking axis responsive to the bale stacking module forming the at least one stack of bales on the load bed to permit the agricultural bale accumulator to accumulate the at least one stack of bales in a side-by-side relationship on the load bed;

a load bed leveling module including:

a level determining device adapted to determine the measure of levelness of the load bed relative to the horizontal plane as the agricultural bale accumulator is transported across the ground surface, wherein the level determining device further comprises:

a longitudinal level determining device adapted to determine a first measure of levelness of the load bed along the longitudinal axis relative the horizontal plane as the agricultural bale accumulator is transported across the ground surface; and

a lateral level determining device adapted to determine a second measure of levelness of the load bed along the lateral axis relative the horizontal plane as the agricultural bale accumulator is transported across the ground surface; and

a level controlling device adapted to change a leveling position, within a predetermined range of leveling positions, of the load bed relative to the horizontal plane responsive to the measure of levelness to compensate for the degree of levelness of the ground surface relative to the horizontal plane thereby encouraging the plurality of bales accumulated on the load bed located at the predetermined positions to remain located at the predetermined positions as the agricultural bale accumulator is transported across the ground surface, wherein the level controlling device further comprises:

a longitudinal level controlling device adapted to change the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness to compensate for the degree of levelness of the ground surface along the longitudinal axis relative to the horizontal plane thereby encouraging the plurality of bales accumulated on the load bed located at the predetermined positions to remain located at the predetermined positions as the agricultural bale accumulator is transported across the ground surface; and

a lateral level controlling device adapted to change the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness to compensate for the degree of levelness of the ground surface along the lateral axis relative to the horizontal plane thereby encouraging the plurality of bales accumulated on the load bed located at the predetermined positions to remain located at the predetermined positions as the agricultural bale accumulator is transported across the ground surface.

35. An agricultural bale accumulator according to claim 34:

wherein the level controlling device positions the load bed at an intermediate leveling position between a minimum leveling position and a maximum leveling position of the predetermined range of leveling positions when the ground surface and the load bed are substantially level with the horizontal plane to permit the level controlling device to change the leveling position, within the predetermined range of leveling positions, of portions of the load bed in either a positive direction or a negative direction relative to the horizontal plane responsive to the measure of levelness.

36. An agricultural bale accumulator according to claim 34 wherein the longitudinal level controlling device is adapted to change the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative the horizontal plane when the first measure of levelness is undesirable and is adapted to not change the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative the horizontal plane when the first measure of levelness is desirable.

37. An agricultural bale accumulator according to claim 34:

wherein the base module further comprises:

a frame mechanically coupled to the load bed and adapted to support the load bed above the ground surface, wherein the load bed is mechanically coupled to the frame about a pivot axis disposed substantially parallel to the lateral axis, and

wherein the longitudinal level controlling device further comprises:

a first longitudinal level controlling device mechanically coupled to the frame and the load bed and adapted to pivot the load bed about the pivot axis responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

38. An agricultural bale accumulator according to claim 37:

wherein the frame has a forward end portion and a rear end portion disposed along the longitudinal axis as referenced to a forward traveling direction of the agricultural bale accumulator, wherein the load bed is mechanically coupled to the frame about the pivot axis at the rear end

portion of the frame between a forward end portion of the load bed and a rear end portion of the load bed as referenced to the forward traveling direction of the agricultural bale accumulator, and wherein the forward end portion of the frame is disposed closer to the ground than the rear end portion of the frame as the agricultural bale accumulator is transported across the ground surface to permit the frame to be disposed at an acute angle relative to the ground surface with a closed end of the acute angle leading an open end of the acute angle as the agricultural bale accumulator is transported across the ground surface, and

wherein the level controlling device positions the load bed at an intermediate leveling position between a minimum leveling position and a maximum leveling position of the predetermined range of leveling positions when the ground surface and the load bed are substantially level with the horizontal plane to permit the first longitudinal level controlling device to pivot the forward end portion of the load bed about the pivot axis in either a positive direction or a negative direction relative to the horizontal plane in correspondence with the rear end portion of the load bed being pivoted about the pivot axis in either the negative direction or the positive direction, respectively, relative to the horizontal plane, responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

39. An agricultural bale accumulator according to claim 37 wherein first longitudinal level controlling device is further adapted to pivot the load bed about the pivot axis between a bale receiving position and a bale discharging position relative to the frame, wherein the load bed assumes the leveling position, within the predetermined range of leveling positions, when the load bed is in the bale receiving position to permit the load bed to receive and accumulate thereon the plurality of bales, and wherein the load bed assumes an inclined position relative to the frame when the load bed is in the bale discharging position to permit the plurality of bales to be discharged from the load bed to the ground surface under a gravitational force acting on the plurality of bales.

40. An agricultural bale accumulator according to claim 34:  
wherein the base module further comprises:

a frame mechanically coupled to the load bed and adapted to support the load bed above the ground surface, wherein a forward end portion of the frame, as referenced to a forward traveling direction of the agricultural bale accumulator, is adapted to be mechanically coupled to a hitch on towing unit to permit the agricultural bale accumulator to be pulled in tandem behind the towing unit, and

wherein the longitudinal level controlling device further comprises:

a second longitudinal level controlling device mechanically coupled to the forward end portion of the frame and adapted to change a frame leveling position, within a predetermined range of frame leveling positions, of the forward end portion of the frame relative to the hitch

responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness..

5 41. An agricultural bale accumulator according to claim 40:

wherein the second longitudinal level controlling device positions the load bed at an intermediate frame leveling position between a minimum frame leveling position and a maximum frame leveling position of the predetermined range of leveling positions when the ground surface and the load bed are substantially level with the horizontal plane to permit the second longitudinal  
10 level controlling device to change the frame leveling position, within the predetermined range of frame leveling positions, of portions of the frame in either a positive direction or a negative direction relative to the horizontal plane responsive to the first measure of levelness.

42. An agricultural bale accumulator according to claim 34 wherein the lateral level controlling  
15 device is adapted to change the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative the horizontal plane when the second measure of levelness is undesirable and is adapted to not change the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative the horizontal plane when the second measure of levelness is desirable.

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43. An agricultural bale accumulator according to claim 34:

wherein the base module further comprises:

a frame mechanically coupled to the load bed and adapted to support the load bed above the ground surface; and

25 a first wheel and a second wheel mechanically coupled to first and second opposite sides of the frame, respectively, along a wheel axis disposed substantially parallel to the lateral axis, adapted to support the frame above the ground surface, and adapted to permit the agricultural bale accumulator to be transported across the ground surface, and

wherein the lateral level controlling device further comprises:

30 a first lateral level controlling device mechanically coupled between the first side of the frame and the first support wheel and adapted to change a frame leveling position, within a predetermined range of frame leveling positions, of the first side of the frame relative to the first support wheel responsive to the second measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the  
35 lateral axis relative to the horizontal plane responsive to the second measure of levelness; and

a second lateral level controlling device mechanically coupled between the second side of the frame and the second support wheel and adapted to change the frame leveling position, within the predetermined range of the frame leveling positions, of the second side of the frame relative to the second support wheel responsive to the second measure of levelness to effectuate  
40 the change of the leveling position, within the predetermined range of leveling positions, of the

load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness.

44. An agricultural bale accumulator according to claim 43:

5 wherein the first lateral level controlling device positions the first side of the frame at a first intermediate frame leveling position between a first minimum frame leveling position and a first maximum leveling frame position of the predetermined range of frame leveling positions when the ground surface and the frame are substantially level with the horizontal plane along the lateral axis to permit the first lateral level controlling device to change the frame leveling position, within the  
10 predetermined range of frame leveling positions, the first side of the frame in either a positive direction or a negative direction relative to the horizontal plane responsive to the first measure of levelness,

wherein the second lateral level controlling device positions the second side of the frame at a second intermediate frame leveling position between a second minimum frame leveling position  
15 and a second maximum leveling frame position of the predetermined range of frame leveling positions when the ground surface and the frame are substantially level with the horizontal plane along the lateral axis to permit the second lateral level controlling device to change the frame leveling position, within the predetermined range of frame leveling positions, the second side of the frame in either a positive direction or a negative direction relative to the horizontal plane  
20 responsive to the second measure of levelness, and

wherein the first side of the frame and the second side of the frame are substantially level with the horizontal plane along the lateral axis when the first lateral level controlling device positions the first side of the frame at the first intermediate frame leveling position and when the second lateral level controlling device positions the second side of the frame at the second  
25 intermediate frame leveling position to permit the load bed to be substantially level with the horizontal plane along the lateral axis.

45. An agricultural bale accumulator according to claim 34:

30 wherein the agricultural bale accumulator is adapted to be mechanically coupled to an agricultural baler to permit the agricultural bale accumulator to be pulled in tandem behind the agricultural baler, wherein the plurality of bales are successively ejected from a bale chamber of the agricultural baler and are successively received on the load bed at a bale entry region along the bale receiving axis, and

wherein the agricultural bale accumulator further comprises:

35 a bale support bridge adapted to be mechanically coupled to the load bed at a bale entry region and to the bale chamber of the agricultural baler along the bale receiving axis, wherein bale support bridge is adapted to support and guide the plurality of bales as the plurality of bales move along the bale receiving axis from the bale chamber of the agricultural baler to the load bed at the bale entry region while the level controlling device changes the leveling position, within the

predetermined range of leveling positions, of the load bed relative to the horizontal plane responsive to the measure of levelness.

46. An agricultural bale accumulator according to claim 34 wherein at least one of any portion of the level determining device and any portion of the level controlling device of the load bed leveling module is attachable to and detachable from the agricultural bale accumulator independently of any other module on the agricultural bale accumulator.

47. An agricultural bale accumulator comprising:

a base module adapted to be supported by and transported across a ground surface, wherein the ground surface has a degree of levelness, relative to a horizontal plane, which varies across the ground surface, the base module including:

a load bed being substantially planar and having a measure of levelness, relative to the horizontal plane, which varies in accordance with the degree of levelness as the agricultural bale accumulator is transported across the ground surface, wherein the load bed is adapted to receive thereon a plurality of bales along a bale receiving axis and is adapted to accumulate thereon the plurality of bales at predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, wherein an undesirable amount of the measure of levelness encourages the plurality of bales located at the predetermined positions on the load bed to move from the predetermined positions as the agricultural bale accumulator is transported across the ground surface, wherein the load bed has a longitudinal axis disposed substantially parallel with the bale receiving axis and a lateral axis disposed substantially perpendicular to the longitudinal axis;

a frame mechanically coupled to the load bed about a pivot axis disposed substantially parallel to the lateral axis and adapted to support the load bed above the ground surface;

a first wheel and a second wheel mechanically coupled to first and second opposite sides of the frame, respectively, along a wheel axis disposed substantially parallel to the lateral axis, adapted to support the frame above the ground surface, and adapted to permit the agricultural bale accumulator to be transported across the ground surface; and

a bale stacking module adapted to form at least one stack of bales, having at least two bales, along a bale stacking axis disposed vertically transverse to the bale receiving axis responsive to receiving the plurality of bales on the load bed to permit the agricultural bale accumulator to accumulate the at least one stack of bales on the load bed;

a bale transfer module adapted to transfer the at least one stack of bales on the load bed across the load bed along a bale transferring axis disposed horizontally transverse to the bale receiving axis responsive to the bale stacking module forming the at least one stack of bales on the load bed to permit the agricultural bale accumulator to accumulate the at least one stack of bales in a side-by-side relationship on the load bed;



a load bed leveling module including:

a level determining device adapted to determine the measure of levelness of the load bed relative to the horizontal plane as the agricultural bale accumulator is transported across the ground surface, wherein the level determining device further comprises:

5 a longitudinal level determining device adapted to determine a first measure of levelness of the load bed along the longitudinal axis relative the horizontal plane as the agricultural bale accumulator is transported across the ground surface; and

10 a lateral level determining device adapted to determine a second measure of levelness of the load bed along the lateral axis relative the horizontal plane as the agricultural bale accumulator is transported across the ground surface; and

15 a level controlling device adapted to change a leveling position, within a predetermined range of leveling positions, of the load bed relative to the horizontal plane responsive to the measure of levelness to compensate for the degree of levelness of the ground surface relative to the horizontal plane thereby encouraging the plurality of bales accumulated on the load bed located at the predetermined positions to remain located at the predetermined positions as the agricultural bale accumulator is transported across the ground surface, wherein the level controlling device further comprises:

20 a longitudinal level controlling device adapted to change the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness to compensate for the degree of levelness of the ground surface along the longitudinal axis relative to the horizontal plane thereby encouraging the plurality of bales accumulated on the load bed located at the predetermined positions to remain located at the predetermined positions as the agricultural bale accumulator is transported across the ground surface,

25 wherein the longitudinal level controlling device is adapted to change the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative the horizontal plane when the first measure of levelness is undesirable and is adapted to not change the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative the horizontal plane when  
30 the first measure of levelness is desirable, and

wherein the longitudinal level controlling device further comprises:

35 a first longitudinal level controlling device mechanically coupled to the frame and the load bed and adapted to pivot the load bed about the pivot axis responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness; and

40 a lateral level controlling device adapted to change the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness to compensate for the degree of levelness of the ground surface along the lateral axis relative to the horizontal plane thereby

encouraging the plurality of bales accumulated on the load bed located at the predetermined positions to remain located at the predetermined positions as the agricultural bale accumulator is transported across the ground surface,

wherein the lateral level controlling device is adapted to change the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative the horizontal plane when the second measure of levelness is undesirable and is adapted to not change the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative the horizontal plane when the second measure of levelness is desirable,

wherein the lateral level controlling device further comprises:

a first lateral level controlling device mechanically coupled between the first side of the frame and the first support wheel and adapted to change a frame leveling position, within a predetermined range of frame leveling positions, of the first side of the frame relative to the first support wheel responsive to the second measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness; and

a second lateral level controlling device mechanically coupled between the second side of the frame and the second support wheel and adapted to change the frame leveling position, within the predetermined range of the frame leveling positions, of the second side of the frame relative to the second support wheel responsive to the second measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness.

48. An agricultural bale accumulator according to claim 47:

wherein the level controlling device positions the load bed at an intermediate leveling position between a minimum leveling position and a maximum leveling position of the predetermined range of leveling positions when the ground surface and the load bed are substantially level with the horizontal plane to permit the level controlling device to change the leveling position, within the predetermined range of leveling positions, of portions of the load bed in either a positive direction or a negative direction relative to the horizontal plane responsive to the measure of levelness.

49. An agricultural bale accumulator according to claim 47:

wherein the frame has a forward end portion and a rear end portion disposed along the longitudinal axis as referenced to a forward traveling direction of the agricultural bale accumulator, wherein the load bed is mechanically coupled to the frame about the pivot axis at the rear end portion of the frame between a forward end portion of the load bed and a rear end portion of the load bed as referenced to the forward traveling direction of the agricultural bale accumulator, and

wherein the forward end portion of the frame is disposed closer to the ground than the rear end portion of the frame as the agricultural bale accumulator is transported across the ground surface to permit the frame to be disposed at an acute angle relative to the ground surface with a closed end of the acute angle leading an open end of the acute angle as the agricultural bale accumulator is transported across the ground surface, and

wherein the level controlling device positions the load bed at an intermediate leveling position between a minimum leveling position and a maximum leveling position of the predetermined range of leveling positions when the ground surface and the load bed are substantially level with the horizontal plane to permit the first longitudinal level controlling device to pivot the forward end portion of the load bed about the pivot axis in either a positive direction or a negative direction relative to the horizontal plane in correspondence with the rear end portion of the load bed being pivoted about the pivot axis in either the negative direction or the positive direction, respectively, relative to the horizontal plane, responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

50. An agricultural bale accumulator according to claim 47 wherein first longitudinal level controlling device is further adapted to pivot the load bed about the pivot axis between a bale receiving position and a bale discharging position relative to the frame, wherein the load bed assumes the leveling position, within the predetermined range of leveling positions, when the load bed is in the bale receiving position to permit the load bed to receive and accumulate thereon the plurality of bales, and wherein the load bed assumes an inclined position relative to the frame when the load bed is in the bale discharging position to permit the plurality of bales to be discharged from the load bed to the ground surface under a gravitational force acting on the plurality of bales.

51. An agricultural bale accumulator according to claim 47:

wherein a forward end portion of the frame, as referenced to a forward traveling direction of the agricultural bale accumulator, is adapted to be mechanically coupled to a hitch on towing unit to permit the agricultural bale accumulator to be pulled in tandem behind the towing unit, and

wherein the longitudinal level controlling device further comprises:

a second longitudinal level controlling device mechanically coupled to the forward end portion of the frame and adapted to change a frame leveling position, within a predetermined range of frame leveling positions, of the forward end portion of the frame relative to the hitch responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

52. An agricultural bale accumulator according to claim 51:

wherein the second longitudinal level controlling device positions the load bed at an intermediate frame leveling position between a minimum frame leveling position and a maximum frame leveling position of the predetermined range of leveling positions when the ground surface and the load bed are substantially level with the horizontal plane to permit the second longitudinal level controlling device to change the frame leveling position, within the predetermined range of frame leveling positions, of portions of the frame in either a positive direction or a negative direction relative to the horizontal plane responsive to the first measure of levelness.

53. An agricultural bale accumulator according to claim 47:

wherein the first lateral level controlling device positions the first side of the frame at a first intermediate frame leveling position between a first minimum frame leveling position and a first maximum leveling frame position of the predetermined range of frame leveling positions when the ground surface and the frame are substantially level with the horizontal plane along the lateral axis to permit the first lateral level controlling device to change the frame leveling position, within the predetermined range of frame leveling positions, the first side of the frame in either a positive direction or a negative direction relative to the horizontal plane responsive to the first measure of levelness,

wherein the second lateral level controlling device positions the second side of the frame at a second intermediate frame leveling position between a second minimum frame leveling position and a second maximum leveling frame position of the predetermined range of frame leveling positions when the ground surface and the frame are substantially level with the horizontal plane along the lateral axis to permit the second lateral level controlling device to change the frame leveling position, within the predetermined range of frame leveling positions, the second side of the frame in either a positive direction or a negative direction relative to the horizontal plane responsive to the second measure of levelness, and

wherein the first side of the frame and the second side of the frame are substantially level with the horizontal plane along the lateral axis when the first lateral level controlling device positions the first side of the frame at the first intermediate frame leveling position and when the second lateral level controlling device positions the second side of the frame at the second intermediate frame leveling position to permit the load bed to be substantially level with the horizontal plane along the lateral axis.

54. An agricultural bale accumulator according to claim 47:

wherein the agricultural bale accumulator is adapted to be mechanically coupled to an agricultural baler to permit the agricultural bale accumulator to be pulled in tandem behind the agricultural baler, wherein the plurality of bales are successively ejected from a bale chamber of the agricultural baler and are successively received on the load bed at a bale entry region along the bale receiving axis, and

wherein the agricultural bale accumulator further comprises:

a bale support bridge adapted to be mechanically coupled to the load bed at a bale entry region and to the bale chamber of the agricultural baler along the bale receiving axis, wherein bale support bridge is adapted to support and guide the plurality of bales as the plurality of bales  
5 move along the bale receiving axis from the bale chamber of the agricultural baler to the load bed at the bale entry region while the level controlling device changes the leveling position, within the predetermined range of leveling positions, of the load bed relative to the horizontal plane responsive to the measure of levelness.

- 10 55. An agricultural bale accumulator according to claim 47 wherein at least one of any portion of the level determining device and any portion of the level controlling device of the load bed leveling module is attachable to and detachable from the agricultural bale accumulator independently of any other module on the agricultural bale accumulator.

15 Side Bale Stabilization Module:

56. An agricultural bale accumulator according to claim 1:

wherein the load bed has a first side disposed essentially opposite to and essentially parallel to a second side of the load bed;

- 20 a bale transfer module adapted to transfer the plurality of bales across the load bed along a bale transfer axis horizontally transverse to the bale receiving axis responsive to the plurality of bales being received on the load bed to accumulate on the load bed the plurality of bales at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface; and

- 25 a lateral bale stabilization module including:

a first extension table which is substantially planar, wherein the first extension table has a first side disposed essentially opposite to and essentially parallel to a second side of the first extension table;

- 30 a first extension table attachment mechanism connected to the first side of the first extension table and the first side of the base module to permit the first extension table to be moveable relative to the base module between a stowed position and an unstowed position, wherein the agricultural bale accumulator has a first bale carrying capacity when the first extension table is in the stowed position by not permitting at least one bale of the plurality of bales to be received on the first extension table, and wherein the agricultural bale accumulator has a second  
35 bale carrying capacity, greater than the first bale carrying capacity, when the first extension table is in the unstowed position by permitting at least one bale of the plurality of bales to be received on the first extension table; and

- a first extension table movement mechanism connected to the first extension table and the base module and adapted to move the first extension table relative to the base module  
40 between the stowed position and the unstowed position, wherein the first extension table

movement mechanism is further adapted to maintain the first extension table in the stowed position to permit physical contact between at least a portion of the first extension table and at least one bale of the plurality of bales accumulated on the load bed at a location adjacent to the first extension table to encourage the plurality of bales located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, and adapted to move the first extension table from the stowed position to the unstowed position responsive to the bale transfer module transferring the plurality of bales across the load bed towards the first extension table to permit the at least one bale of the plurality of bales to be transferred from the location on the load bed adjacent to the first extension table to a location on the first extension table as the agricultural bale accumulator is transported across the ground surface.

57. An agricultural bale accumulator according to claim 56:

wherein the first extension table attachment mechanism further comprises a first hinge for pivotally connecting the first side of the first extension table to the first side of the base module about a first hinge axis, and

wherein the first extension table movement mechanism is adapted to cause the first extension table to pivot in an upward direction towards the base module about the first hinge axis so that the first extension table is disposed substantially perpendicular to the load bed and above a bale receiving surface of the load bed when the first extension table is in the stowed position, and is adapted to cause the first extension table to pivot in a downward direction away from the base module about the first hinge axis so that the first extension table is disposed substantially coplanar with the load bed and adjacent to the first side of the load bed when the first extension table is in the unstowed position.

58. An agricultural bale accumulator according to claim 57 wherein at least one of a portion of a bale receiving surface of the load bed, located between the first extension table and a substantially planar bale receiving surface of the load bed, and a bale receiving surface of the first extension table, located in the unstowed position, is disposed at an angle somewhat less than one hundred eighty degrees (180°) relative to the substantially planar bale receiving surface of the load bed to cause the at least one bale of the plurality of bales positioned on the at least one of the portion of a bale receiving surface of the load bed and the bale receiving surface of the first extension table, respectively, to lean in an inward direction towards the substantially planar bale receiving surface of the load bed to encourage the plurality of bales located at the predetermined positions on the load bed and on the first extension table to remain located at the predetermined positions on the load bed and on the first extension table as the agricultural bale accumulator is transported across the ground surface.

59. An agricultural bale accumulator according to claim 57 wherein the lateral bale stabilization module further comprises:

a first bale stabilizing member representing the portion of the first extension table and mechanically coupled to the second side of the first extension table, wherein the first bale stabilizing member is moveable between at least one of a stowed position, a first unstowed position, and a second unstowed position, wherein the first bale stabilizing member is disposed substantially coplanar with the first extension table and adjacent to the second side of the first extension table when the first bale stabilizing member is in the stowed position and when the first extension table is in the stowed position, wherein the first bale stabilizing member is disposed substantially coplanar with the first extension table and away from the second side of the first extension table when the first bale stabilizing member is in the first unstowed position and when the first extension table is in the stowed position, and wherein the first bale stabilizing member is disposed above a bale receiving surface of the first extension table when the first bale stabilizing member is in the second unstowed position and when the first extension table is in the unstowed position to permit physical contact between at least one of the first bale stabilizing member and the first extension table and the at least one of the plurality of bales disposed on at least one of the bale receiving surface of the first extension table and the bale receiving surface of the load bed to encourage the plurality of bales located at the predetermined positions on the load bed and on the first extension table to remain located at the predetermined positions on the load bed and on the first extension table as the agricultural bale accumulator is transported across the ground surface.

60. An agricultural bale accumulator according to claim 56:

wherein the first extension table attachment mechanism further comprises:

a first sliding mechanism for slidably connecting the first side of the first extension table to the first side of the base module, and

wherein the first extension table movement mechanism is adapted to cause the first extension table to retract in an inward direction towards the base module substantially parallel to the bale transfer axis so that the first extension table is disposed substantially parallel to the load bed and substantially inside a perimeter of the load bed when the first extension table is in the stowed position, and is adapted to cause the first extension table to extend in an outward direction away from the base module substantially parallel to the bale transfer axis so that the first extension table is disposed substantially co-planar with the load bed, adjacent to the first side of the load bed and substantially outside a perimeter of the load bed when the first extension table is in the unstowed position; and

wherein the load bed extension module further comprises:

a first bale stabilizing member mechanically coupled to the second side of the first extension table, wherein the first bale stabilizing member is disposed above a bale receiving surface of the first extension table to permit physical contact between the first bale stabilizing member and the at least one bale of the plurality of bales accumulated on the load bed adjacent to the first extension table when the first extension table is in the stowed position to encourage the plurality of bales located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across

the ground surface and to permit physical contact between the first bale stabilizing member and the at least one bale of the plurality of bales accumulated on the bale receiving surface of the first extension table when the first extension table is in the unstowed position to encourage the plurality of bales located at the predetermined positions on the load bed and on the first extension table to remain located at the predetermined positions on the load bed and on the first extension table as the agricultural bale accumulator is transported across the ground surface.

61. An agricultural bale accumulator according to claim 60 wherein at least one of a portion of a bale receiving surface of the load bed, located between the first extension table and a substantially planar bale receiving surface of the load bed, and a bale receiving surface of the first extension table, located in the unstowed position, is disposed at an angle somewhat less than one hundred eighty degrees ( $180^\circ$ ) relative to the substantially planar bale receiving surface of the load bed to cause the at least one bale of the plurality of bales positioned on the at least one of the portion of a bale receiving surface of the load bed and the bale receiving surface of the first extension table, respectively, to lean in an inward direction towards the substantially planar bale receiving surface of the load bed to encourage the plurality of bales located at the predetermined positions on the load bed and on the first extension table to remain located at the predetermined positions on the load bed and on the first extension table as the agricultural bale accumulator is transported across the ground surface.

62. An agricultural bale accumulator according to claim 56 wherein at least one of a portion of a bale receiving surface of the load bed, located between the first extension table and a substantially planar bale receiving surface of the load bed, and a bale receiving surface of the first extension table, located in the unstowed position, is disposed at an angle somewhat less than one hundred eighty degrees ( $180^\circ$ ) relative to the substantially planar bale receiving surface of the load bed to cause the at least one bale of the plurality of bales positioned on the at least one of the portion of a bale receiving surface of the load bed and the bale receiving surface of the first extension table, respectively, to lean in an inward direction towards the substantially planar bale receiving surface of the load bed to encourage the plurality of bales located at the predetermined positions on the load bed and on the first extension table to remain located at the predetermined positions on the load bed and on the first extension table as the agricultural bale accumulator is transported across the ground surface.

63. An agricultural bale accumulator according to claim 56 wherein the first extension table movement mechanism further comprises:

a first cylinder adapted to move the first extension table relative to the base module between the stowed position and the unstowed position responsive to receiving pressurized fluid from a fluid source.



64. An agricultural bale accumulator according to claim 56 wherein the first extension table movement mechanism further comprises:

5 a first counterweight movement mechanism mechanically coupled to the base module and the first extension table and adapted to permit a weight of at least one bale of the plurality of bales disposed on the load bed at least one predetermined position to move the first extension table from the stowed position to the unstowed position.

65. An agricultural bale accumulator according to claim 64 wherein the first counterweight movement mechanism further comprises:

10 a first passive energy storage device mechanically coupled to the first extension table and the base module and adapted to exert a first bias force on the first extension table to permit the first extension table to move from the unstowed position to the stowed position responsive to the first bias force when none of the at least one bale of the plurality of bales are disposed on the first extension table and when none of the at least one bale of the plurality of bales are disposed on the  
15 load bed at the at least one predetermined position; and

a second passive energy storage device mechanically coupled to the first extension table and the base module and adapted to exert a second bias force, greater than the first bias source and provided by the weight of the at least one bale of the plurality of bales disposed on the load bed at the at least one predetermined position, on the first extension table to permit the first extension  
20 table to move from the stowed position to the unstowed position responsive to the second bias force.

66. An agricultural bale accumulator according to claim 65 wherein the first counterweight movement mechanism further comprises:

25 a first latch mechanism mechanically coupled to the first extension table and the base module and adapted to hold the first extension table in the stowed position to prevent the second bias force from moving the first extension table from the stowed position to the unstowed position while the at least one bale of the plurality of bales is being accumulated on the load bed, and adapted to release the first extension table from the stowed position responsive to the bale transfer  
30 module transferring the at least one bale of the plurality of bales across the load bed towards the first extension table to permit the first extension table to move from the stowed position to the unstowed position responsive to the second bias force and to permit the at least one bale of the plurality of bales to be transferred from the location on the load bed adjacent to the first extension table to a location on the first extension table as the agricultural bale accumulator is transported  
35 across the ground surface.

67. An agricultural bale accumulator according to claim 65 wherein the first counterweight movement mechanism further comprises:

40 a second latch mechanism mechanically coupled to the first extension table and the base module and adapted to hold the first extension table in the unstowed position to prevent the first

bias force from moving the first extension table from the unstowed position to the stowed position while the at least one of the plurality of bales is being accumulated on the load bed and on the first extension table, and adapted to release the first extension table from the unstowed position responsive to a bale discharge module discharging the plurality of bales to the ground surface to permit the first extension table to move from the unstowed position to the stowed position responsive to the first bias force.

68. An agricultural bale accumulator according to claim 56 lateral bale stabilization module further includes:

a second extension table which is substantially planar, wherein the second extension table has a first side disposed essentially opposite to and essentially parallel to a second side of the second extension table;

a second extension table attachment mechanism connected to the first side of the second extension table and the second side of the base module to permit the second extension table to be moveable relative to the base module between a stowed position and an unstowed position, wherein the agricultural bale accumulator has one of the first and the second bale carrying capacity when the second extension table is in the stowed position by not permitting at least one of the plurality of bales to be received on the second extension table, and wherein the agricultural bale accumulator has a third bale carrying capacity, greater than one of the first and the second bale carrying capacity, when the second extension table is in the unstowed position by permitting at least one of the plurality of bales to be received on the second extension table; and

a second extension table movement mechanism connected to the second extension table and the base module and adapted to move the second extension table relative to the base module between the stowed position and the unstowed position, wherein the second extension table movement mechanism is further adapted to maintain the second extension table in the stowed position to permit physical contact between at least a portion of the second extension table and at least one bale of the plurality of bales accumulated on the load bed at a location adjacent to the second extension table to encourage the plurality of bales located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, and adapted to move the second extension table from the stowed position to the unstowed position responsive to the bale transfer module transferring the plurality of bales across the load bed towards the second extension table to permit the at least one bale of the plurality of bales to be transferred from the location on the load bed adjacent to the second extension table to a location on the second extension table as the agricultural bale accumulator is transported across the ground surface.

69. An agricultural bale accumulator according to claim 68 wherein the first extension table movement mechanism and the second extension table movement mechanism alternately move the first extension table and the second extension table, respectively, from their respective stowed positions and unstowed positions responsive to the bale transfer module alternately transferring at

least a first bale of the plurality of bales across the load bed along the bale transfer axis towards the first extension table and transferring at least a second bale of the plurality of bales across the load bed along the bale transfer axis towards the second extension table, respectively.

- 5 70. An agricultural bale accumulator according to claim 56 wherein the lateral bale stabilization module further includes:

a third extension table which is substantially planar, wherein the third extension table has a first side disposed essentially opposite to and essentially parallel to a second side of the third extension table;

- 10 a third extension table attachment mechanism connected to the first side of the third extension table and the second side of the first extension table to permit the third extension table to be moveable relative to the base module between a stowed position and an unstowed position, wherein the agricultural bale accumulator has one of the first and the second bale carrying capacity when the third extension table is in the stowed position by not permitting at least one of the  
15 plurality of bales to be received on the third extension table, and wherein the agricultural bale accumulator has a third bale carrying capacity, greater than one of the first and the second bale carrying capacity, when the third extension table is in the unstowed position by permitting at least one of the plurality of bales to be received on the third extension table; and

- a third extension table movement mechanism connected to the third extension table and at  
20 least one of the first extension table and the base module and adapted to move the third extension table relative to the base module between the stowed position and the unstowed position, wherein the third extension table movement mechanism is further adapted to maintain the third extension table in the stowed position to permit physical contact between at least one of at least a portion of the first extension table and at least a portion of the third extension table and at least one bale of the  
25 plurality of bales accumulated at a location on one of the load bed and the first extension table adjacent to the third extension table to encourage the plurality of bales located at the predetermined positions on the load bed and on the first extension table to remain located at the predetermined positions on the load bed and on the first extension table as the agricultural bale accumulator is transported across the ground surface, and adapted to move the first extension table and the third  
30 extension table from their respective stowed positions to their respective unstowed positions responsive to the bale transfer module transferring the plurality of bales across the load bed towards the first extension table and the third extension table to permit the at least one bale of the plurality of bales to be transferred from the location on one of the load bed and the first extension table adjacent to the first extension table and the third extension table, respectively, to a location on  
35 one of the first extension table and the third extension table, respectively, as the agricultural bale accumulator is transported across the ground surface.

table is in the unstowed position and stowed position, respectively.

71. An agricultural bale accumulator according to claim 70:

wherein the first extension table attachment mechanism further comprises a first hinge for pivotally connecting the first side of the first extension table to the first side of the base module about a first hinge axis,

5 wherein the third extension table attachment mechanism further comprises a third hinge for pivotally connecting the first side of the third extension table to the second side of the first extension table about a third hinge axis,

10 wherein the first extension table movement mechanism is adapted to cause the first extension table to pivot in an upward direction towards the base module about the first hinge axis so that the first extension table is disposed substantially perpendicular to the load bed and above a bale receiving surface of the load bed when the first extension table is in the stowed position to permit physical contact between the at least a portion of the first extension table and the at least one of the plurality of bales accumulated on the load bed at the location adjacent to the first extension table to encourage the plurality of bales located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface,

15 wherein the first extension table movement mechanism is adapted to cause the first extension table to pivot in a downward direction away from the base module about the first hinge axis so that the first extension table is disposed substantially co-planar with the load bed and adjacent to the first side of the load bed when the first extension table is in the unstowed position responsive to the bale transfer module transferring the plurality of bales across the load bed towards the first extension table to permit at least one bale of the plurality of bales to be transferred from the location on the load bed adjacent to the first extension table to the location on the first extension table as the agricultural bale accumulator is transported across the ground surface,

20 wherein the third extension table movement mechanism is adapted to cause the third extension table to pivot in an upward direction towards the base module about the third hinge axis so that the third extension table is disposed substantially perpendicular to at least one of the load bed and the first extension table and above a bale receiving surface of at least one of the load bed and the first extension table, respectively, when the first extension table is in the stowed position to permit physical contact between the at least a portion of the third extension table and the at least one bale of the plurality of bales accumulated on one of the load bed and the first extension table, respectively, at the location adjacent to the third extension table to encourage the at least one bale of the plurality of bales located at the predetermined positions on at least one of the load bed and the first extension table, respectively, to remain located at the predetermined positions on at least one of the load bed and the first extension table, respectively, as the agricultural bale accumulator is transported across the ground surface,

25 wherein the third extension table movement mechanism is adapted to cause the third extension table to pivot in a downward direction away from the base module about the third hinge axis so that the third extension table is disposed substantially co-planar with the load bed and the first extension table and adjacent to the second side of the first extension table when the third

extension table is in the unstowed position to permit at least one bale of the plurality of bales to be transferred from the location on the first extension table adjacent to the third extension table to the location on the third extension table as the agricultural bale accumulator is transported across the ground surface.

5

72. An agricultural bale accumulator according to claim 70 wherein the third extension table movement mechanism further comprises:

10 a third cylinder adapted to move the third extension table relative to the base module between the stowed position and the unstowed position responsive to receiving pressurized fluid from the fluid source.

73. An agricultural bale accumulator according to claim 70 wherein the third extension table movement mechanism further comprises:

15 a third counterweight movement mechanism, mechanically coupled to at least one of the base module and the first extension table, and mechanically coupled to the third extension table, and adapted to permit a weight of at least one bale of the plurality of bales disposed on at least one of the load bed and the first extension table at least one predetermined position to move the third extension table from the stowed position to the unstowed position.

20 74. An agricultural bale accumulator according to claim 73 wherein the third counterweight movement mechanism further comprises:

a third passive energy storage device mechanically coupled to the third extension table and mechanically coupled to at least one of the base module the first extension table, the third passive energy storage device adapted to exert a third bias force on the third extension table to permit the  
25 third extension table to move from the unstowed position to the stowed position responsive to the third bias force when none of the at least one bale of the plurality of bales are disposed on the third extension table and when none of the at least one bale of the plurality of bales are disposed on the at least one of the load bed and the first extension table at the at least one predetermined position; and

30 a fourth passive energy storage device mechanically coupled to the third extension table and mechanically coupled to at least one of the base module the first extension table, the fourth passive energy storage device adapted to exert a fourth bias force, greater than the third bias source and provided by the weight of the at least one bale of the plurality of bales disposed on at least one of the load bed and the first extension table at at least one predetermined position, on the  
35 third extension table to permit the third extension table to move from the stowed position to the unstowed position responsive to the fourth bias force.

75. An agricultural bale accumulator according to claim 74 wherein the third counterweight movement mechanism further comprises:

a third latch mechanism mechanically coupled to the third extension table and mechanically coupled to at least one of the base module the first extension table, the third latch mechanism adapted to hold the third extension table in the stowed position to prevent the fourth bias force from moving the third extension table from the stowed position to the unstowed position while the at least one of the plurality of bales is being accumulated on at least one of the load bed and the first extension table, and adapted to release the third extension table from the stowed position responsive to the bale transfer module transferring the plurality of bales across at least one of the load bed and the first extension table towards the third extension table to permit the third extension table to move from the stowed position to the unstowed position responsive to the fourth bias force and to permit the at least one bale of the plurality of bales to be transferred from the location on the first extension table adjacent to the third extension table to a location on the third extension table as the agricultural bale accumulator is transported across the ground surface.

76. An agricultural bale accumulator according to claim 74 wherein the third counterweight movement mechanism further comprises:

a fourth latch mechanism mechanically coupled to the third extension table and mechanically coupled to at least one of the base module the first extension table, the fourth latch mechanism adapted to hold the first extension table in the unstowed position to prevent the third bias force from moving the third extension table from the unstowed position to the stowed position while the at least one of the plurality of bales is being accumulated on at least one of the load bed, the first extension table and the third extension table, and adapted to release the first extension table from the unstowed position responsive to a bale discharge module discharging the plurality of bales from the load bed, the first extension table and the third extension table to the ground surface to permit the third extension table to move from the unstowed position to the stowed position responsive to the third bias force.

73. An agricultural bale accumulator according to claim 56 further comprising:

a bale stacking module adapted to form at least one stack of bales, having at least two bales of the plurality of bales, on at least one of the load bed and the first extension table along a bale stacking axis, vertically transverse to the bale receiving axis and the bale transfer axis, responsive to the plurality of bales being received on the load bed,

wherein the bale transfer module transfers the at least one stack of bales across the load bed along the bale transfer axis responsive to the bale stacking module forming the at least one stack of bales on the load bed to accumulate on the load bed at least one stack of bales at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, and

wherein the first extension table encourages the at least one stack of bales located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface.

74. An agricultural bale accumulator according to claim 56 further comprising:  
a bale discharge module operable to discharge the plurality of bales, accumulated on the load bed and the first extension table, to the ground surface.

5 75. An agricultural bale accumulator according to claim 74  
wherein the base module further comprises:  
a frame mechanically coupled to the load bed and adapted to support the load bed above the ground surface, and

10 wherein the bale discharge module further comprises:  
at least a portion of the load bed pivotally connected to the frame about a pivot point disposed on a horizontal pivot axis, substantially parallel to the bale transfer axis, and moveable relative to the frame between a bale accumulating position and a bale discharging position, wherein the at least a portion of the load bed is in a horizontal position relative to the  
15 frame when the at least a portion of the load bed is in the bale accumulating position to permit the at least a portion of the load bed and the first extension table to accumulate thereon the plurality of bales, and wherein the at least a portion of the load bed is in an inclined position relative to the frame when the load bed is in the bale discharging position to permit the at least a portion of the load bed and the first extension table to discharge the plurality of bales accumulated thereon to the  
20 ground surface.

76. An agricultural bale accumulator comprising:  
a base module adapted to be supported by and transported across a ground surface, wherein the ground surface has a degree of levelness, relative to a horizontal plane, which varies  
25 across the ground surface, the base module including:

a load bed being substantially planar and having a measure of levelness, relative to the horizontal plane, which varies in accordance with the degree of levelness as the agricultural bale accumulator is transported across the ground surface, wherein the load bed is adapted to receive on the load bed a plurality of bales along a bale receiving axis, and wherein the load bed  
30 has a first side disposed essentially opposite to and essentially parallel to a second side of the load bed;

a bale transfer module adapted to transfer the plurality of bales across the load bed along a bale transfer axis horizontally transverse to the bale receiving axis responsive to the plurality of bales being received on the load bed to accumulate on the load bed the plurality of bales at  
35 predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, wherein an undesirable amount of the measure of levelness encourages the plurality of bales located at the predetermined positions on the load bed to move from the predetermined positions as the agricultural bale accumulator is transported across the ground surface; and

a lateral bale stabilization module including:

a first extension table which is substantially planar, wherein the first extension table has a first side disposed essentially opposite to and essentially parallel to a second side of the first extension table;

5 a first hinge for pivotally connecting the first side of the first extension table and the first side of the base module to permit the first extension table to be moveable relative to the base module between a stowed position and an unstowed position, wherein the agricultural bale accumulator has a first bale carrying capacity when the first extension table is in the stowed position by not permitting at least one bale of the plurality of bales to be received on the first extension table, and wherein the agricultural bale accumulator has a second bale carrying capacity, greater than the first bale carrying capacity, when the first extension table is in the unstowed position by permitting at least one bale of the plurality of bales to be received on the first extension table; and

15 a first extension table movement mechanism connected to the first extension table and the base module and adapted to move the first extension table relative to the base module between the stowed position and the unstowed position, wherein the first extension table movement mechanism is adapted to cause the first extension table to pivot in an upward direction towards the base module about the first hinge axis so that the first extension table is disposed substantially perpendicular to the load bed and above a bale receiving surface of the load bed when the first extension table is in the stowed position, and is adapted to cause the first extension table to pivot in a downward direction away from the base module about the first hinge axis so that the first extension table is disposed substantially co-planar with the load bed and adjacent to the first side of the load bed when the first extension table is in the unstowed position, wherein the first extension table movement mechanism is further adapted to maintain the first extension table in the stowed position to permit physical contact between at least a portion of the first extension table and at least one bale of the plurality of bales accumulated on the load bed at a location adjacent to the first extension table to encourage the plurality of bales located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, and adapted to move the first extension table from the stowed position to the unstowed position responsive to the bale transfer module transferring the plurality of bales across the load bed towards the first extension table to permit the at least one bale of the plurality of bales to be transferred from the location on the load bed adjacent to the first extension table to a location on the first extension table as the agricultural bale accumulator is transported across the ground surface.

35 77. An agricultural bale accumulator according to claim 76 wherein at least one of a portion of a bale receiving surface of the load bed, located between the first extension table and a substantially planar bale receiving surface of the load bed, and a bale receiving surface of the first extension table, located in the unstowed position, is disposed at an angle somewhat less than one hundred eighty degrees (180°) relative to the substantially planar bale receiving surface of the load



bed to cause the at least one bale of the plurality of bales positioned on the at least one of the portion of a bale receiving surface of the load bed and the bale receiving surface of the first extension table, respectively, to lean in an inward direction towards the substantially planar bale receiving surface of the load bed to encourage the plurality of bales located at the predetermined positions on the load bed and on the first extension table to remain located at the predetermined positions on the load bed and on the first extension table as the agricultural bale accumulator is transported across the ground surface.

78. An agricultural bale accumulator according to claim 76 wherein the lateral bale stabilization module further comprises:

a first bale stabilizing member representing the portion of the first extension table and mechanically coupled to the second side of the first extension table, wherein the first bale stabilizing member is moveable between at least one of a stowed position, a first unstowed position, and a second unstowed position, wherein the first bale stabilizing member is disposed substantially coplanar with the first extension table and adjacent to the second side of the first extension table when the first bale stabilizing member is in the stowed position and when the first extension table is in the stowed position, wherein the first bale stabilizing member is disposed substantially coplanar with the first extension table and away from the second side of the first extension table when the first bale stabilizing member is in the first unstowed position and when the first extension table is in the stowed position, and wherein the first bale stabilizing member is disposed above a bale receiving surface of the first extension table when the first bale stabilizing member is in the second unstowed position and when the first extension table is in the unstowed position to permit physical contact between at least one of the first bale stabilizing member and the first extension table and the at least one of the plurality of bales disposed on at least one of the bale receiving surface of the first extension table and the bale receiving surface of the load bed to encourage the plurality of bales located at the predetermined positions on the load bed and on the first extension table to remain located at the predetermined positions on the load bed and on the first extension table as the agricultural bale accumulator is transported across the ground surface.

79. An agricultural bale accumulator according to claim 76 wherein the first extension table movement mechanism further comprises:

a first cylinder adapted to move the first extension table relative to the base module between the stowed position and the unstowed position responsive to receiving pressurized fluid from a fluid source.

80. An agricultural bale accumulator according to claim 76 wherein the first extension table movement mechanism further comprises:

a first counterweight movement mechanism mechanically coupled to the base module and the first extension table and adapted to permit a weight of at least one bale of the plurality of bales

disposed on the load bed at at least one predetermined position to move the first extension table from the stowed position to the unstowed position.

81. An agricultural bale accumulator according to claim 80 wherein the first counterweight movement mechanism further comprises:

a first passive energy storage device mechanically coupled to the first extension table and the base module and adapted to exert a first bias force on the first extension table to permit the first extension table to move from the unstowed position to the stowed position responsive to the first bias force when none of the at least one bale of the plurality of bales are disposed on the first extension table and when none of the at least one bale of the plurality of bales are disposed on the load bed at the at least one predetermined position; and

a second passive energy storage device mechanically coupled to the first extension table and the base module and adapted to exert a second bias force, greater than the first bias source and provided by the weight of the at least one bale of the plurality of bales disposed on the load bed at the at least one predetermined position, on the first extension table to permit the first extension table to move from the stowed position to the unstowed position responsive to the second bias force.

82. An agricultural bale accumulator according to claim 81 wherein the first counterweight movement mechanism further comprises:

a first latch mechanism mechanically coupled to the first extension table and the base module and adapted to hold the first extension table in the stowed position to prevent the second bias force from moving the first extension table from the stowed position to the unstowed position while the at least one bale of the plurality of bales is being accumulated on the load bed, and adapted to release the first extension table from the stowed position responsive to the bale transfer module transferring the at least one bale of the plurality of bales across the load bed towards the first extension table to permit the first extension table to move from the stowed position to the unstowed position responsive to the second bias force and to permit the at least one bale of the plurality of bales to be transferred from the location on the load bed adjacent to the first extension table to a location on the first extension table as the agricultural bale accumulator is transported across the ground surface.

83. An agricultural bale accumulator according to claim 81 wherein the first counterweight movement mechanism further comprises:

a second latch mechanism mechanically coupled to the first extension table and the base module and adapted to hold the first extension table in the unstowed position to prevent the first bias force from moving the first extension table from the unstowed position to the stowed position while the at least one of the plurality of bales is being accumulated on the load bed and on the first extension table, and adapted to release the first extension table from the unstowed position responsive to a bale discharge module discharging the plurality of bales to the ground surface to

permit the first extension table to move from the unstowed position to the stowed position responsive to the first bias force.

84. An agricultural bale accumulator according to claim 76 the lateral bale stabilization module further includes:

a second extension table which is substantially planar, wherein the second extension table has a first side disposed essentially opposite to and essentially parallel to a second side of the second extension table;

a second extension table attachment mechanism connected to the first side of the second extension table and the second side of the base module to permit the second extension table to be moveable relative to the base module between a stowed position and an unstowed position, wherein the agricultural bale accumulator has one of the first and the second bale carrying capacity when the second extension table is in the stowed position by not permitting at least one of the plurality of bales to be received on the second extension table, and wherein the agricultural bale accumulator has a third bale carrying capacity, greater than one of the first and the second bale carrying capacity, when the second extension table is in the unstowed position by permitting at least one of the plurality of bales to be received on the second extension table; and

a second extension table movement mechanism connected to the second extension table and the base module and adapted to move the second extension table relative to the base module between the stowed position and the unstowed position, wherein the second extension table movement mechanism is further adapted to maintain the second extension table in the stowed position to permit physical contact between at least a portion of the second extension table and at least one bale of the plurality of bales accumulated on the load bed at a location adjacent to the second extension table to encourage the plurality of bales located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, and adapted to move the second extension table from the stowed position to the unstowed position responsive to the bale transfer module transferring the plurality of bales across the load bed towards the second extension table to permit the at least one bale of the plurality of bales to be transferred from the location on the load bed adjacent to the second extension table to a location on the second extension table as the agricultural bale accumulator is transported across the ground surface.

85. An agricultural bale accumulator according to claim 84 wherein the first extension table movement mechanism and the second extension table movement mechanism alternately move the first extension table and the second extension table, respectively, from their respective stowed positions and unstowed positions responsive to the bale transfer module alternately transferring at least a first bale of the plurality of bales across the load bed along the bale transfer axis towards the first extension table and transferring at least a second bale of the plurality of bales across the load bed along the bale transfer axis towards the second extension table, respectively.

86. An agricultural bale accumulator according to claim 76 wherein the lateral bale stabilization module further includes:

5 a third extension table which is substantially planar, wherein the third extension table has a first side disposed essentially opposite to and essentially parallel to a second side of the third extension table;

10 a third extension table attachment mechanism connected to the first side of the third extension table and the second side of the first extension table to permit the third extension table to be moveable relative to the base module between a stowed position and an unstowed position, wherein the agricultural bale accumulator has one of the first and the second bale carrying capacity when the third extension table is in the stowed position by not permitting at least one of the plurality of bales to be received on the third extension table, and wherein the agricultural bale accumulator has a third bale carrying capacity, greater than one of the first and the second bale carrying capacity, when the third extension table is in the unstowed position by permitting at least one of the plurality of bales to be received on the third extension table; and

15 a third extension table movement mechanism connected to the third extension table and at least one of the first extension table and the base module and adapted to move the third extension table relative to the base module between the stowed position and the unstowed position, wherein the third extension table movement mechanism is further adapted to maintain the third extension table in the stowed position to permit physical contact between at least one of at least a portion of the first extension table and at least a portion of the third extension table and at least one bale of the plurality of bales accumulated at a location on one of the load bed and the first extension table adjacent to the third extension table to encourage the plurality of bales located at the predetermined positions on the load bed and on the first extension table to remain located at the predetermined positions on the load bed and on the first extension table as the agricultural bale accumulator is transported across the ground surface, and adapted to move the first extension table and the third extension table from their respective stowed positions to their respective unstowed positions responsive to the bale transfer module transferring the plurality of bales across the load bed towards the first extension table and the third extension table to permit the at least one bale of the plurality of bales to be transferred from the location on one of the load bed and the first extension table adjacent to the first extension table and the third extension table, respectively, to a location on one of the first extension table and the third extension table, respectively, as the agricultural bale accumulator is transported across the ground surface.

35 87. An agricultural bale accumulator according to claim 86:

wherein the first extension table attachment mechanism further comprises a first hinge for pivotally connecting the first side of the first extension table to the first side of the base module about a first hinge axis,

wherein the third extension table attachment mechanism further comprises a third hinge for pivotally connecting the first side of the third extension table to the second side of the first extension table about a third hinge axis,

5 wherein the first extension table movement mechanism is adapted to cause the first extension table to pivot in an upward direction towards the base module about the first hinge axis so that the first extension table is disposed substantially perpendicular to the load bed and above a bale receiving surface of the load bed when the first extension table is in the stowed position to permit physical contact between the at least a portion of the first extension table and the at least one of the plurality of bales accumulated on the load bed at the location adjacent to the first extension  
10 table to encourage the plurality of bales located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface,

wherein the first extension table movement mechanism is adapted to cause the first extension table to pivot in a downward direction away from the base module about the first hinge  
15 axis so that the first extension table is disposed substantially co-planar with the load bed and adjacent to the first side of the load bed when the first extension table is in the unstowed position responsive to the bale transfer module transferring the plurality of bales across the load bed towards the first extension table to permit at least one bale of the plurality of bales to be transferred from the location on the load bed adjacent to the first extension table to the location on the first  
20 extension table as the agricultural bale accumulator is transported across the ground surface,

wherein the third extension table movement mechanism is adapted to cause the third extension table to pivot in an upward direction towards the base module about the third hinge axis so that the third extension table is disposed substantially perpendicular to at least one of the load bed and the first extension table and above a bale receiving surface of at least one of the load bed  
25 and the first extension table, respectively, when the first extension table is in the stowed position to permit physical contact between the at least a portion of the third extension table and the at least one bale of the plurality of bales accumulated on one of the load bed and the first extension table, respectively, at the location adjacent to the third extension table to encourage the at least one bale of the plurality of bales located at the predetermined positions on at least one of the load bed and  
30 the first extension table, respectively, to remain located at the predetermined positions on at least one of the load bed and the first extension table, respectively, as the agricultural bale accumulator is transported across the ground surface,

wherein the third extension table movement mechanism is adapted to cause the third extension table to pivot in a downward direction away from the base module about the third hinge  
35 axis so that the third extension table is disposed substantially co-planar with the load bed and the first extension table and adjacent to the second side of the first extension table when the third extension table is in the unstowed position to permit at least one bale of the plurality of bales to be transferred from the location on the first extension table adjacent to the third extension table to the location on the third extension table as the agricultural bale accumulator is transported across the  
40 ground surface.

88. An agricultural bale accumulator according to claim 86 wherein the third extension table movement mechanism further comprises:

5 a third cylinder adapted to move the third extension table relative to the base module between the stowed position and the unstowed position responsive to receiving pressurized fluid from the fluid source.

89. An agricultural bale accumulator according to claim 86 wherein the third extension table movement mechanism further comprises:

10 a third counterweight movement mechanism, mechanically coupled to at least one of the base module and the first extension table, and mechanically coupled to the third extension table, and adapted to permit a weight of at least one bale of the plurality of bales disposed on at least one of the load bed and the first extension table at at least one predetermined position to move the third extension table from the stowed position to the unstowed position.

15 90. An agricultural bale accumulator according to claim 89 wherein the third counterweight movement mechanism further comprises:

20 a third passive energy storage device mechanically coupled to the third extension table and mechanically coupled to at least one of the base module the first extension table, the third passive energy storage device adapted to exert a third bias force on the third extension table to permit the third extension table to move from the unstowed position to the stowed position responsive to the third bias force when none of the at least one bale of the plurality of bales are disposed on the third extension table and when none of the at least one bale of the plurality of bales are disposed on the at least one of the load bed and the first extension table at the at least one predetermined position;  
25 and

30 a fourth passive energy storage device mechanically coupled to the third extension table and mechanically coupled to at least one of the base module the first extension table, the fourth passive energy storage device adapted to exert a fourth bias force, greater than the third bias source and provided by the weight of the at least one bale of the plurality of bales disposed on at least one of the load bed and the first extension table at at least one predetermined position, on the third extension table to permit the third extension table to move from the stowed position to the unstowed position responsive to the fourth bias force.

35 91. An agricultural bale accumulator according to claim 90 wherein the third counterweight movement mechanism further comprises:

40 a third latch mechanism mechanically coupled to the third extension table and mechanically coupled to at least one of the base module the first extension table, the third latch mechanism adapted to hold the third extension table in the stowed position to prevent the fourth bias force from moving the third extension table from the stowed position to the unstowed position while the at least one of the plurality of bales is being accumulated on at least one of the load bed and the

first extension table, and adapted to release the third extension table from the stowed position responsive to the bale transfer module transferring the plurality of bales across at least one of the load bed and the first extension table towards the third extension table to permit the third extension table to move from the stowed position to the unstowed position responsive to the fourth bias force and to permit the at least one bale of the plurality of bales to be transferred from the location on the first extension table adjacent to the third extension table to a location on the third extension table as the agricultural bale accumulator is transported across the ground surface.

92. An agricultural bale accumulator according to claim 90 wherein the third counterweight movement mechanism further comprises:

a fourth latch mechanism mechanically coupled to the third extension table and mechanically coupled to at least one of the base module the first extension table, the fourth latch mechanism adapted to hold the first extension table in the unstowed position to prevent the third bias force from moving the third extension table from the unstowed position to the stowed position while the at least one of the plurality of bales is being accumulated on at least one of the load bed, the first extension table and the third extension table, and adapted to release the first extension table from the unstowed position responsive to a bale discharge module discharging the plurality of bales from the load bed, the first extension table and the third extension table to the ground surface to permit the third extension table to move from the unstowed position to the stowed position responsive to the third bias force.

93. An agricultural bale accumulator according to claim 76 further comprising:

a bale stacking module adapted to form at least one stack of bales, having at least two bales of the plurality of bales, on at least one of the load bed and the first extension table along a bale stacking axis, vertically transverse to the bale receiving axis and the bale transfer axis, responsive to the plurality of bales being received on the load bed,

wherein the bale transfer module transfers the at least one stack of bales across the load bed along the bale transfer axis responsive to the bale stacking module forming the at least one stack of bales on the load bed to accumulate on the load bed at least one stack of bales at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, and

wherein the first extension table encourages the at least one stack of bales located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface.

94. An agricultural bale accumulator according to claim 76 further comprising:

a bale discharge module operable to discharge the plurality of bales, accumulated on the load bed and the first extension table, to the ground surface.

95. An agricultural bale accumulator according to claim 94 wherein the base module further comprises:

a frame mechanically coupled to the load bed and adapted to support the load bed above the ground surface, and

5 wherein the bale discharge module further comprises:

at least a portion of the load bed pivotally connected to the frame about a pivot point disposed on a horizontal pivot axis, substantially parallel to the bale transfer axis, and moveable relative to the frame between a bale accumulating position and a bale discharging position, wherein the at least a portion of the load bed is in a horizontal position relative to the frame when the at least a portion of the load bed is in the bale accumulating position to permit the at least a portion of the load bed and the first extension table to accumulate thereon the plurality of bales, and wherein the at least a portion of the load bed is in an inclined position relative to the frame when the load bed is in the bale discharging position to permit the at least a portion of the load bed and the first extension table to discharge the plurality of bales accumulated thereon to the ground surface.

96. An agricultural bale accumulator comprising:

a base module adapted to be supported by and transported across a ground surface, the ground surface having a degree of levelness, relative to a horizontal plane, which varies across the ground surface, the base module including:

a load bed being substantially planar and having a measure of levelness, relative to the horizontal plane, which varies in accordance with the degree of levelness as the agricultural bale accumulator is transported across the ground surface, wherein the load bed is adapted to receive on the load bed a plurality of bales along a bale receiving axis, and wherein the load bed has a first side disposed essentially opposite to and essentially parallel to a second side of the load bed;

a bale stacking module adapted to form at least one stack of bales, having at least two bales of the plurality of bales, on the load bed along a bale stacking axis, vertically transverse to the bale receiving axis, responsive to the plurality of bales being received on the load bed;

a bale transfer module adapted to transfer the at least one stack of bales on the load bed across the load bed along a bale transfer axis, horizontally transverse to the bale receiving axis and the bale stacking axis, responsive to the bale stacking module forming the at least one stack of bales on the load bed to permit the agricultural bale accumulator to accumulate on the load bed the at least one stack of bales at predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, wherein an undesirable amount of the measure of levelness encourages the plurality of bales located at the predetermined positions on the load bed to move from the predetermined positions as the agricultural bale accumulator is transported across the ground surface; and

a lateral bale stabilization module including:



a first extension table which is substantially planar, wherein the first extension table has a first side disposed essentially opposite to and essentially parallel to a second side of the first extension table;

a first hinge for pivotally connecting the first side of the first extension table and the first side of the base module to permit the first extension table to be moveable relative to the base module between a stowed position and an unstowed position, wherein the agricultural bale accumulator has a first bale carrying capacity when the first extension table is in the stowed position by not permitting the at least one stack of bales to be received on the first extension table, and wherein the agricultural bale accumulator has a second bale carrying capacity, greater than the first bale carrying capacity, when the first extension table is in the unstowed position by permitting the at least one stack of bales to be received on the first extension table; and

a first extension table movement mechanism connected to the first extension table and the base module and adapted to move the first extension table relative to the base module between the stowed position and the unstowed position, wherein the first extension table movement mechanism is adapted to cause the first extension table to pivot in an upward direction towards the base module about the first hinge axis so that the first extension table is disposed substantially perpendicular to the load bed and above a bale receiving surface of the load bed when the first extension table is in the stowed position, and is adapted to cause the first extension table to pivot in a downward direction away from the base module about the first hinge axis so that the first extension table is disposed substantially co-planar with the load bed and adjacent to the first side of the load bed when the first extension table is in the unstowed position, wherein the first extension table movement mechanism is further adapted to maintain the first extension table in the stowed position to permit physical contact between at least a portion of the first extension table and the at least one stack of bales accumulated on the load bed at a location adjacent to the first extension table to encourage the at least one stack of bales located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, and adapted to move the first extension table from the stowed position to the unstowed position responsive to the bale transfer module transferring the at least one stack of bales across the load bed towards the first extension table to permit the at least one stack of bales to be transferred from the location on the load bed adjacent to the first extension table to a location on the first extension table as the agricultural bale accumulator is transported across the ground surface.

97. An agricultural bale accumulator according to claim 96 wherein at least one of a portion of a bale receiving surface of the load bed, located between the first extension table and a substantially planar bale receiving surface of the load bed, and a bale receiving surface of the first extension table, located in the unstowed position, is disposed at an angle somewhat less than one hundred eighty degrees (180°) relative to the substantially planar bale receiving surface of the load bed to cause the at least one stack of bales positioned on the at least one of the portion of a bale receiving surface of the load bed and the bale receiving surface of the first extension table,

respectively, to lean in an inward direction towards the substantially planar bale receiving surface of the load bed to encourage the at least one stack of bales located at the predetermined positions on the load bed and on the first extension table to remain located at the predetermined positions on the load bed and on the first extension table as the agricultural bale accumulator is transported  
5 across the ground surface.

98. An agricultural bale accumulator according to claim 96 wherein the lateral bale stabilization module further comprises:

a first bale stabilizing member representing the portion of the first extension table and mechanically coupled to the second side of the first extension table, wherein the first bale stabilizing member is moveable between at least one of a stowed position, a first unstowed position, and a second unstowed position, wherein the first bale stabilizing member is disposed substantially coplanar with the first extension table and adjacent to the second side of the first extension table when the first bale stabilizing member is in the stowed position and when the first  
10 extension table is in the stowed position, wherein the first bale stabilizing member is disposed substantially coplanar with the first extension table and away from the second side of the first extension table when the first bale stabilizing member is in the first unstowed position and when the first extension table is in the stowed position, and wherein the first bale stabilizing member is disposed above a bale receiving surface of the first extension table when the first bale stabilizing  
15 member is in the second unstowed position and when the first extension table is in the unstowed position to permit physical contact between at least one of the first bale stabilizing member and the first extension table and the at least one stack of bales disposed on at least one of the bale receiving surface of the first extension table and the bale receiving surface of the load bed to encourage the plurality of bales located at the predetermined positions on the load bed and on the first extension  
20 table to remain located at the predetermined positions on the load bed and on the first extension table as the agricultural bale accumulator is transported across the ground surface.

99. An agricultural bale accumulator according to claim 96 wherein the first extension table movement mechanism further comprises:

a first cylinder adapted to move the first extension table relative to the base module between the stowed position and the unstowed position responsive to receiving pressurized fluid from a fluid source.  
30

100. An agricultural bale accumulator according to claim 96 wherein the first extension table movement mechanism further comprises:  
35

a first counterweight movement mechanism mechanically coupled to the base module and the first extension table and adapted to permit a weight of the at least one stack of bales disposed on the load bed at at least one predetermined position to move the first extension table from the stowed position to the unstowed position.

101. An agricultural bale accumulator according to claim 100 wherein the first counterweight movement mechanism further comprises:

5 a first passive energy storage device mechanically coupled to the first extension table and the base module and adapted to exert a first bias force on the first extension table to permit the first extension table to move from the unstowed position to the stowed position responsive to the first bias force when none of the at least one stack of bales are disposed on the first extension table and when none of the at least one stack of bales are disposed on the load bed at the at least one predetermined position; and

10 a second passive energy storage device mechanically coupled to the first extension table and the base module and adapted to exert a second bias force, greater than the first bias source and provided by the weight of the at least one stack of bales disposed on the load bed at the at least one predetermined position, on the first extension table to permit the first extension table to move from the stowed position to the unstowed position responsive to the second bias force.

15 102. An agricultural bale accumulator according to claim 101 wherein the first counterweight movement mechanism further comprises:

20 a first latch mechanism mechanically coupled to the first extension table and the base module and adapted to hold the first extension table in the stowed position to prevent the second bias force from moving the first extension table from the stowed position to the unstowed position while the at least one stack of bales is being accumulated on the load bed, and adapted to release the first extension table from the stowed position responsive to the bale transfer module transferring the at least one stack of bales across the load bed towards the first extension table to permit the first extension table to move from the stowed position to the unstowed position responsive to the second bias force and to permit the at least one stack of bales to be transferred from the location on the load bed adjacent to the first extension table to a location on the first extension table as the agricultural bale accumulator is transported across the ground surface.

30 103. An agricultural bale accumulator according to claim 101 wherein the first counterweight movement mechanism further comprises:

35 a second latch mechanism mechanically coupled to the first extension table and the base module and adapted to hold the first extension table in the unstowed position to prevent the first bias force from moving the first extension table from the unstowed position to the stowed position while the at least one stack of bales is being accumulated on the load bed and on the first extension table, and adapted to release the first extension table from the unstowed position responsive to a bale discharge module discharging the at least one stack of bales to the ground surface to permit the first extension table to move from the unstowed position to the stowed position responsive to the first bias force.

104. An agricultural bale accumulator according to claim 96 the lateral bale stabilization module further includes:

5 a second extension table which is substantially planar, wherein the second extension table has a first side disposed essentially opposite to and essentially parallel to a second side of the second extension table;

10 a second extension table attachment mechanism connected to the first side of the second extension table and the second side of the base module to permit the second extension table to be moveable relative to the base module between a stowed position and an unstowed position, wherein the agricultural bale accumulator has one of the first and the second bale carrying capacity when the second extension table is in the stowed position by not permitting the at least one stack of bales to be received on the second extension table, and wherein the agricultural bale accumulator has a third bale carrying capacity, greater than one of the first and the second bale carrying capacity, when the second extension table is in the unstowed position by permitting the at least one stack of bales to be received on the second extension table; and

15 a second extension table movement mechanism connected to the second extension table and the base module and adapted to move the second extension table relative to the base module between the stowed position and the unstowed position, wherein the second extension table movement mechanism is further adapted to maintain the second extension table in the stowed position to permit physical contact between at least a portion of the second extension table and the at least one stack of bales accumulated on the load bed at a location adjacent to the second extension table to encourage the at least one stack of bales located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, and adapted to move the second extension table from the stowed position to the unstowed position responsive to the bale transfer module transferring the at least one stack of bales across the load bed towards the second extension table to permit the at least one stack of bales to be transferred from the location on the load bed adjacent to the second extension table to a location on the second extension table as the agricultural bale accumulator is transported across the ground surface.

30 105. An agricultural bale accumulator according to claim 104 wherein the first extension table movement mechanism and the second extension table movement mechanism alternately move the first extension table and the second extension table, respectively, from their respective stowed positions and unstowed positions responsive to the bale transfer module alternately transferring at least a first stack of bales across the load bed along the bale transfer axis towards the first extension table and transferring at least a second stack of bales across the load bed along the bale transfer axis towards the second extension table, respectively.

106. An agricultural bale accumulator according to claim 96 wherein the lateral bale stabilization module further includes:

a third extension table which is substantially planar, wherein the third extension table has a first side disposed essentially opposite to and essentially parallel to a second side of the third extension table;

5 a third extension table attachment mechanism connected to the first side of the third extension table and the second side of the first extension table to permit the third extension table to be moveable relative to the base module between a stowed position and an unstowed position, wherein the agricultural bale accumulator has one of the first and the second bale carrying capacity when the third extension table is in the stowed position by not permitting the at least one stack of bales to be received on the third extension table, and wherein the agricultural bale accumulator has  
10 a third bale carrying capacity, greater than one of the first and the second bale carrying capacity, when the third extension table is in the unstowed position by permitting the at least one stack of bales to be received on the third extension table; and

a third extension table movement mechanism connected to the third extension table and at least one of the first extension table and the base module and adapted to move the third extension  
15 table relative to the base module between the stowed position and the unstowed position, wherein the third extension table movement mechanism is further adapted to maintain the third extension table in the stowed position to permit physical contact between at least one of at least a portion of the first extension table and at least a portion of the third extension table and the at least one stack of bales accumulated at a location on one of the load bed and the first extension table adjacent to  
20 the third extension table to encourage the at least one stack of bales located at the predetermined positions on the load bed and on the first extension table to remain located at the predetermined positions on the load bed and on the first extension table as the agricultural bale accumulator is transported across the ground surface, and adapted to move the first extension table and the third extension table from their respective stowed positions to their respective unstowed positions  
25 responsive to the bale transfer module transferring the at least one stack of bales across the load bed towards the first extension table and the third extension table to permit the at least one stack of bales to be transferred from the location on one of the load bed and the first extension table adjacent to the first extension table and the third extension table, respectively, to a location on one of the first extension table and the third extension table, respectively, as the agricultural bale  
30 accumulator is transported across the ground surface.

107. An agricultural bale accumulator according to claim 106:

wherein the first extension table attachment mechanism further comprises a first hinge for pivotally connecting the first side of the first extension table to the first side of the base module  
35 about a first hinge axis,

wherein the third extension table attachment mechanism further comprises a third hinge for pivotally connecting the first side of the third extension table to the second side of the first extension table about a third hinge axis,

wherein the first extension table movement mechanism is adapted to cause the first  
40 extension table to pivot in an upward direction towards the base module about the first hinge axis

so that the first extension table is disposed substantially perpendicular to the load bed and above a bale receiving surface of the load bed when the first extension table is in the stowed position to permit physical contact between the at least a portion of the first extension table and the at least one stack of bales accumulated on the load bed at the location adjacent to the first extension table to encourage the at least one stack of bales located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface,

wherein the first extension table movement mechanism is adapted to cause the first extension table to pivot in a downward direction away from the base module about the first hinge axis so that the first extension table is disposed substantially co-planar with the load bed and adjacent to the first side of the load bed when the first extension table is in the unstowed position responsive to the bale transfer module transferring the at least one stack of bales across the load bed towards the first extension table to permit the at least one stack of bales to be transferred from the location on the load bed adjacent to the first extension table to the location on the first extension table as the agricultural bale accumulator is transported across the ground surface,

wherein the third extension table movement mechanism is adapted to cause the third extension table to pivot in an upward direction towards the base module about the third hinge axis so that the third extension table is disposed substantially perpendicular to at least one of the load bed and the first extension table and above a bale receiving surface of at least one of the load bed and the first extension table, respectively, when the first extension table is in the stowed position to permit physical contact between the at least a portion of the third extension table and the at least one stack of bales accumulated on one of the load bed and the first extension table, respectively, at the location adjacent to the third extension table to encourage the at least one stack of bales located at the predetermined positions on at least one of the load bed and the first extension table, respectively, to remain located at the predetermined positions on at least one of the load bed and the first extension table, respectively, as the agricultural bale accumulator is transported across the ground surface,

wherein the third extension table movement mechanism is adapted to cause the third extension table to pivot in a downward direction away from the base module about the third hinge axis so that the third extension table is disposed substantially co-planar with the load bed and the first extension table and adjacent to the second side of the first extension table when the third extension table is in the unstowed position to permit the at least one stack of bales to be transferred from the location on the first extension table adjacent to the third extension table to the location on the third extension table as the agricultural bale accumulator is transported across the ground surface.

108. An agricultural bale accumulator according to claim 106 wherein the third extension table movement mechanism further comprises:

a third cylinder adapted to move the third extension table relative to the base module between the stowed position and the unstowed position responsive to receiving pressurized fluid from the fluid source.

5 109. An agricultural bale accumulator according to claim 106 wherein the third extension table movement mechanism further comprises:

10 a third counterweight movement mechanism, mechanically coupled to at least one of the base module and the first extension table, and mechanically coupled to the third extension table, and adapted to permit a weight of the at least one stack of bales disposed on at least one of the load bed and the first extension table at least one predetermined position to move the third extension table from the stowed position to the unstowed position.

110. An agricultural bale accumulator according to claim 109 wherein the third counterweight movement mechanism further comprises:

15 a third passive energy storage device mechanically coupled to the third extension table and mechanically coupled to at least one of the base module the first extension table, the third passive energy storage device adapted to exert a third bias force on the third extension table to permit the third extension table to move from the unstowed position to the stowed position responsive to the third bias force when none of the at least one stack of bales are disposed on the third extension table and when none of the at least one stack of bales are disposed on the at least one of the load bed and the first extension table at the at least one predetermined position; and

20 a fourth passive energy storage device mechanically coupled to the third extension table and mechanically coupled to at least one of the base module the first extension table, the fourth passive energy storage device adapted to exert a fourth bias force, greater than the third bias source and provided by the weight of the at least one stack of bales disposed on at least one of the load bed and the first extension table at at least one predetermined position, on the third extension table to permit the third extension table to move from the stowed position to the unstowed position responsive to the fourth bias force.

30 112. An agricultural bale accumulator according to claim 111 wherein the third counterweight movement mechanism further comprises:

a third latch mechanism mechanically coupled to the third extension table and mechanically coupled to at least one of the base module the first extension table, the third latch mechanism adapted to hold the third extension table in the stowed position to prevent the fourth bias force from moving the third extension table from the stowed position to the unstowed position while the at least one stack of bales is being accumulated on at least one of the load bed and the first extension table, and adapted to release the third extension table from the stowed position responsive to the bale transfer module transferring the at least one stack of bales across at least one of the load bed and the first extension table towards the third extension table to permit the third extension table to move from the stowed position to the unstowed position responsive to the

fourth bias force and to permit the at least one stack of bales to be transferred from the location on the first extension table adjacent to the third extension table to a location on the third extension table as the agricultural bale accumulator is transported across the ground surface.

5 113. An agricultural bale accumulator according to claim 111 wherein the third counterweight movement mechanism further comprises:

10 a fourth latch mechanism mechanically coupled to the third extension table and mechanically coupled to at least one of the base module the first extension table, the fourth latch mechanism adapted to hold the first extension table in the unstowed position to prevent the third bias force from moving the third extension table from the unstowed position to the stowed position while the at least one stack of bales is being accumulated on at least one of the load bed, the first extension table and the third extension table, and adapted to release the first extension table from the unstowed position responsive to a bale discharge module discharging the at least one stack of bales from the load bed, the first extension table and the third extension table to the  
15 ground surface to permit the third extension table to move from the unstowed position to the stowed position responsive to the third bias force.

114. An agricultural bale accumulator according to claim 96 further comprising:

20 a bale discharge module operable to discharge the at least one stack of bales, accumulated on the load bed and the first extension table, to the ground surface.

115. An agricultural bale accumulator according to claim 114 wherein the base module further comprises:

25 a frame mechanically coupled to the load bed and adapted to support the load bed above the ground surface, and

wherein the bale discharge module further comprises:

30 at least a portion of the load bed pivotally connected to the frame about a pivot point disposed on a horizontal pivot axis, substantially parallel to the bale transfer axis, and moveable relative to the frame between a bale accumulating position and a bale discharging position, wherein the at least a portion of the load bed is in a horizontal position relative to the frame when the at least a portion of the load bed is in the bale accumulating position to permit the at least a portion of the load bed and the first extension table to accumulate thereon the at least one stack of bales, and wherein the at least a portion of the load bed is in an inclined position relative to the frame when the load bed is in the bale discharging position to permit the at least a portion of  
35 the load bed and the first extension table to discharge the at least one stack of bales accumulated thereon to the ground surface.



116. An agricultural bale accumulator comprising:

a base module adapted to be supported by and transported across a ground surface, wherein the ground surface has a degree of levelness, relative to a horizontal plane, which varies across the ground surface, the base module including:

5 a load bed being substantially planar and having a measure of levelness, relative to the horizontal plane, which varies in accordance with the degree of levelness as the agricultural bale accumulator is transported across the ground surface, wherein the load bed is adapted to receive on the load bed a plurality of bales along a bale receiving axis, and wherein the load bed has a first side disposed essentially opposite to and essentially parallel to a second side of the load  
10 bed; and

a frame mechanically coupled to the load bed and adapted to support the load bed above the ground surface;

a bale stacking module adapted to form at least one stack of bales, having at least two bales of the plurality of bales, on the load bed along a bale stacking axis, vertically transverse to the bale  
15 receiving axis, responsive to the plurality of bales being received on the load bed;

a bale transfer module adapted to transfer the at least one stack of bales on the load bed across the load bed along a bale transfer axis, horizontally transverse to the bale receiving axis and the bale stacking axis, responsive to the bale stacking module forming the at least one stack of bales on the load bed to permit the agricultural bale accumulator to accumulate on the load bed the  
20 at least one stack of bales at predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, wherein an undesirable amount of the measure of levelness encourages the plurality of bales located at the predetermined positions on the load bed to move from the predetermined positions as the agricultural bale accumulator is transported across the ground surface; and

25 a lateral bale stabilization module including:

a first extension table which is substantially planar, wherein the first extension table has a first side disposed essentially opposite to and essentially parallel to a second side of the first extension table;

a first hinge for pivotally connecting the first side of the first extension table and  
30 the first side of the base module to permit the first extension table to be moveable relative to the base module between a stowed position and an unstowed position, wherein the agricultural bale accumulator has a first bale carrying capacity when the first extension table is in the stowed position by not permitting the at least one stack of bales to be received on the first extension table, and wherein the agricultural bale accumulator has a second bale carrying capacity, greater than the  
35 first bale carrying capacity, when the first extension table is in the unstowed position by permitting the at least one stack of bales to be received on the first extension table;

a first extension table movement mechanism connected to the first extension table and the base module and adapted to move the first extension table relative to the base module between the stowed position and the unstowed position, wherein the first extension table  
40 movement mechanism is adapted to cause the first extension table to pivot in an upward direction

towards the base module about the first hinge axis so that the first extension table is disposed substantially perpendicular to the load bed and above a bale receiving surface of the load bed when the first extension table is in the stowed position, and is adapted to cause the first extension table to pivot in a downward direction away from the base module about the first hinge axis so that the first extension table is disposed substantially co-planar with the load bed and adjacent to the first side of the load bed when the first extension table is in the unstowed position, wherein the first extension table movement mechanism is further adapted to maintain the first extension table in the stowed position to permit physical contact between at least a portion of the first extension table and the at least one stack of bales accumulated on the load bed at a location adjacent to the first extension table to encourage the at least one stack of bales located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, and adapted to move the first extension table from the stowed position to the unstowed position responsive to the bale transfer module transferring the at least one stack of bales across the load bed towards the first extension table to permit the at least one stack of bales to be transferred from the location on the load bed adjacent to the first extension table to a location on the first extension table as the agricultural bale accumulator is transported across the ground surface;

a second extension table which is substantially planar, wherein the second extension table has a first side disposed essentially opposite to and essentially parallel to a second side of the second extension table;

a second hinge for pivotally connecting the first side of the second extension table and the second side of the base module to permit the second extension table to be moveable relative to the base module between a stowed position and an unstowed position, wherein the agricultural bale accumulator has one of the first and the second bale carrying capacity when the second extension table is in the stowed position by not permitting the at least one stack of bales to be received on the second extension table, and wherein the agricultural bale accumulator has a third bale carrying capacity, greater than one of the first and the second bale carrying capacity, when the second extension table is in the unstowed position by permitting the at least one stack of bales to be received on the second extension table; and

a second extension table movement mechanism connected to the second extension table and the base module and adapted to move the second extension table relative to the base module between the stowed position and the unstowed position, wherein the second extension table movement mechanism is adapted to cause the second extension table to pivot in an upward direction towards the base module about the second hinge axis so that the second extension table is disposed substantially perpendicular to the load bed and above the bale receiving surface of the load bed when the second extension table is in the stowed position, and is adapted to cause the second extension table to pivot in a downward direction away from the base module about the second hinge axis so that the second extension table is disposed substantially co-planar with the load bed and adjacent to the second side of the load bed when the second extension table is in the unstowed position, wherein the second extension table movement mechanism is further adapted to

maintain the second extension table in the stowed position to permit physical contact between at least a portion of the second extension table and the at least one stack of bales accumulated on the load bed at a location adjacent to the second extension table to encourage the plurality of bales located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, and adapted to move the second extension table from the stowed position to the unstowed position responsive to the bale transfer module transferring the at least one stack of bales across the load bed towards the second extension table to permit the at least one stack of bales to be transferred from the location on the load bed adjacent to the second extension table to a location on the second extension table as the agricultural bale accumulator is transported across the ground surface,

wherein the first extension table movement mechanism and the second extension table movement mechanism alternately move the first extension table and the second extension table, respectively, from their respective stowed positions and unstowed positions responsive to the bale transfer module alternately transferring at least a first stack of bales across the load bed along the bale transfer axis towards the first extension table and transferring at least a second stack of bales across the load bed along the bale transfer axis towards the second extension table, respectively; and

a bale discharge module operable to discharge the at least one stack of bales, accumulated on the load bed, the first extension table, and the second extension table, to the ground surface, wherein the bale discharge module further comprises:

at least a portion of the load bed pivotally connected to the frame about a pivot point disposed on a horizontal pivot axis, substantially parallel to the bale transfer axis, and moveable relative to the frame between a bale accumulating position and a bale discharging position, wherein the at least a portion of the load bed is in a horizontal position relative to the frame when the at least a portion of the load bed is in the bale accumulating position to permit the at least a portion of the load bed and the first extension table to accumulate thereon the at least one stack of bales, and wherein the at least a portion of the load bed is in an inclined position relative to the frame when the load bed is in the bale discharging position to permit the at least a portion of the load bed and the first extension table to discharge the at least one stack of bales accumulated thereon to the ground surface.

117. An agricultural bale accumulator according to claim 116 wherein at least one of a portion of a bale receiving surface of the load bed, located between the first extension table and a substantially planar bale receiving surface of the load bed, and a bale receiving surface of the first extension table, located in the unstowed position, is disposed at an angle somewhat less than one hundred eighty degrees (180°) relative to the substantially planar bale receiving surface of the load bed to cause the at least one stack of bales positioned on the at least one of the portion of a bale receiving surface of the load bed and the bale receiving surface of the first extension table, respectively, to lean in an inward direction towards the substantially planar bale receiving surface

of the load bed to encourage the at least one stack of bales located at the predetermined positions on the load bed and on the first extension table to remain located at the predetermined positions on the load bed and on the first extension table as the agricultural bale accumulator is transported across the ground surface.

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118. An agricultural bale accumulator according to claim 116 wherein the lateral bale stabilization module further comprises:

10 a first bale stabilizing member representing the portion of the first extension table and mechanically coupled to the second side of the first extension table, wherein the first bale stabilizing member is moveable between at least one of a stowed position, a first unstowed position, and a second unstowed position, wherein the first bale stabilizing member is disposed substantially coplanar with the first extension table and adjacent to the second side of the first extension table when the first bale stabilizing member is in the stowed position and when the first extension table is in the stowed position, wherein the first bale stabilizing member is disposed  
15 substantially coplanar with the first extension table and away from the second side of the first extension table when the first bale stabilizing member is in the first unstowed position and when the first extension table is in the stowed position, and wherein the first bale stabilizing member is disposed above a bale receiving surface of the first extension table when the first bale stabilizing member is in the second unstowed position and when the first extension table is in the unstowed  
20 position to permit physical contact between at least one of the first bale stabilizing member and the first extension table and the at least one stack of bales disposed on at least one of the bale receiving surface of the first extension table and the bale receiving surface of the load bed to encourage the plurality of bales located at the predetermined positions on the load bed and on the first extension table to remain located at the predetermined positions on the load bed and on the first extension  
25 table as the agricultural bale accumulator is transported across the ground surface.

119. An agricultural bale accumulator according to claim 116 wherein the first extension table movement mechanism further comprises:

30 a first cylinder adapted to move the first extension table relative to the base module between the stowed position and the unstowed position responsive to receiving pressurized fluid from a fluid source.

120. An agricultural bale accumulator according to claim 116 wherein the first extension table movement mechanism further comprises:

35 a first counterweight movement mechanism mechanically coupled to the base module and the first extension table and adapted to permit a weight of the at least one stack of bales disposed on the load bed at at least one predetermined position to move the first extension table from the stowed position to the unstowed position.

121. An agricultural bale accumulator according to claim 120 wherein the first counterweight movement mechanism further comprises:

a first passive energy storage device mechanically coupled to the first extension table and the base module and adapted to exert a first bias force on the first extension table to permit the first extension table to move from the unstowed position to the stowed position responsive to the first bias force when none of the at least one stack of bales are disposed on the first extension table and when none of the at least one stack of bales are disposed on the load bed at the at least one predetermined position; and

a second passive energy storage device mechanically coupled to the first extension table and the base module and adapted to exert a second bias force, greater than the first bias source and provided by the weight of the at least one stack of bales disposed on the load bed at the at least one predetermined position, on the first extension table to permit the first extension table to move from the stowed position to the unstowed position responsive to the second bias force.

122. An agricultural bale accumulator according to claim 121 wherein the first counterweight movement mechanism further comprises:

a first latch mechanism mechanically coupled to the first extension table and the base module and adapted to hold the first extension table in the stowed position to prevent the second bias force from moving the first extension table from the stowed position to the unstowed position while the at least one stack of bales is being accumulated on the load bed, and adapted to release the first extension table from the stowed position responsive to the bale transfer module transferring the at least one stack of bales across the load bed towards the first extension table to permit the first extension table to move from the stowed position to the unstowed position responsive to the second bias force and to permit the at least one stack of bales to be transferred from the location on the load bed adjacent to the first extension table to a location on the first extension table as the agricultural bale accumulator is transported across the ground surface.

123. An agricultural bale accumulator according to claim 121 wherein the first counterweight movement mechanism further comprises:

a second latch mechanism mechanically coupled to the first extension table and the base module and adapted to hold the first extension table in the unstowed position to prevent the first bias force from moving the first extension table from the unstowed position to the stowed position while the at least one stack of bales is being accumulated on the load bed and on the first extension table, and adapted to release the first extension table from the unstowed position responsive to a bale discharge module discharging the at least one stack of bales to the ground surface to permit the first extension table to move from the unstowed position to the stowed position responsive to the first bias force.

124. An agricultural bale accumulator according to claim 116 wherein the lateral bale stabilization module further includes:

a third extension table which is substantially planar, wherein the third extension table has a first side disposed essentially opposite to and essentially parallel to a second side of the third extension table;

5 a third extension table attachment mechanism connected to the first side of the third extension table and the second side of the first extension table to permit the third extension table to be moveable relative to the base module between a stowed position and an unstowed position, wherein the agricultural bale accumulator has one of the first and the second bale carrying capacity when the third extension table is in the stowed position by not permitting the at least one stack of bales to be received on the third extension table, and wherein the agricultural bale accumulator has  
10 a third bale carrying capacity, greater than one of the first and the second bale carrying capacity, when the third extension table is in the unstowed position by permitting the at least one stack of bales to be received on the third extension table; and

a third extension table movement mechanism connected to the third extension table and at least one of the first extension table and the base module and adapted to move the third extension  
15 table relative to the base module between the stowed position and the unstowed position, wherein the third extension table movement mechanism is further adapted to maintain the third extension table in the stowed position to permit physical contact between at least one of at least a portion of the first extension table and at least a portion of the third extension table and the at least one stack of bales accumulated at a location on one of the load bed and the first extension table adjacent to  
20 the third extension table to encourage the at least one stack of bales located at the predetermined positions on the load bed and on the first extension table to remain located at the predetermined positions on the load bed and on the first extension table as the agricultural bale accumulator is transported across the ground surface, and adapted to move the first extension table and the third extension table from their respective stowed positions to their respective unstowed positions  
25 responsive to the bale transfer module transferring the at least one stack of bales across the load bed towards the first extension table and the third extension table to permit the at least one stack of bales to be transferred from the location on one of the load bed and the first extension table adjacent to the first extension table and the third extension table, respectively, to a location on one of the first extension table and the third extension table, respectively, as the agricultural bale  
30 accumulator is transported across the ground surface.

125. An agricultural bale accumulator according to claim 124:

wherein the first extension table attachment mechanism further comprises a first hinge for pivotally connecting the first side of the first extension table to the first side of the base module  
35 about a first hinge axis,

wherein the third extension table attachment mechanism further comprises a third hinge for pivotally connecting the first side of the third extension table to the second side of the first extension table about a third hinge axis,

wherein the first extension table movement mechanism is adapted to cause the first  
40 extension table to pivot in an upward direction towards the base module about the first hinge axis

so that the first extension table is disposed substantially perpendicular to the load bed and above a bale receiving surface of the load bed when the first extension table is in the stowed position to permit physical contact between the at least a portion of the first extension table and the at least one stack of bales accumulated on the load bed at the location adjacent to the first extension table to encourage the at least one stack of bales located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface.

wherein the first extension table movement mechanism is adapted to cause the first extension table to pivot in a downward direction away from the base module about the first hinge axis so that the first extension table is disposed substantially co-planar with the load bed and adjacent to the first side of the load bed when the first extension table is in the unstowed position responsive to the bale transfer module transferring the at least one stack of bales across the load bed towards the first extension table to permit the at least one stack of bales to be transferred from the location on the load bed adjacent to the first extension table to the location on the first extension table as the agricultural bale accumulator is transported across the ground surface,

wherein the third extension table movement mechanism is adapted to cause the third extension table to pivot in an upward direction towards the base module about the third hinge axis so that the third extension table is disposed substantially perpendicular to at least one of the load bed and the first extension table and above a bale receiving surface of at least one of the load bed and the first extension table, respectively, when the first extension table is in the stowed position to permit physical contact between the at least a portion of the third extension table and the at least one stack of bales accumulated on one of the load bed and the first extension table, respectively, at the location adjacent to the third extension table to encourage the at least one stack of bales located at the predetermined positions on at least one of the load bed and the first extension table, respectively, to remain located at the predetermined positions on at least one of the load bed and the first extension table, respectively, as the agricultural bale accumulator is transported across the ground surface, and

wherein the third extension table movement mechanism is adapted to cause the third extension table to pivot in a downward direction away from the base module about the third hinge axis so that the third extension table is disposed substantially co-planar with the load bed and the first extension table and adjacent to the second side of the first extension table when the third extension table is in the unstowed position to permit the at least one stack of bales to be transferred from the location on the first extension table adjacent to the third extension table to the location on the third extension table as the agricultural bale accumulator is transported across the ground surface.

126. An agricultural bale accumulator according to claim 124 wherein the third extension table movement mechanism further comprises:

a third cylinder adapted to move the third extension table relative to the base module between the stowed position and the unstowed position responsive to receiving pressurized fluid from the fluid source.

5 127. An agricultural bale accumulator according to claim 124 wherein the third extension table movement mechanism further comprises:

10 a third counterweight movement mechanism, mechanically coupled to at least one of the base module and the first extension table, and mechanically coupled to the third extension table, and adapted to permit a weight of the at least one stack of bales disposed on at least one of the load bed and the first extension table at at least one predetermined position to move the third extension table from the stowed position to the unstowed position.

128. An agricultural bale accumulator according to claim 127 wherein the third counterweight movement mechanism further comprises:

15 a third passive energy storage device mechanically coupled to the third extension table and mechanically coupled to at least one of the base module the first extension table, the third passive energy storage device adapted to exert a third bias force on the third extension table to permit the third extension table to move from the unstowed position to the stowed position responsive to the third bias force when none of the at least one stack of bales are disposed on the third extension table and when none of the at least one stack of bales are disposed on the at least one of the load bed and the first extension table at the at least one predetermined position; and

20 a fourth passive energy storage device mechanically coupled to the third extension table and mechanically coupled to at least one of the base module the first extension table, the fourth passive energy storage device adapted to exert a fourth bias force, greater than the third bias source and provided by the weight of the at least one stack of bales disposed on at least one of the load bed and the first extension table at at least one predetermined position, on the third extension table to permit the third extension table to move from the stowed position to the unstowed position responsive to the fourth bias force.

30 129. An agricultural bale accumulator according to claim 128 wherein the third counterweight movement mechanism further comprises:

35 a third latch mechanism mechanically coupled to the third extension table and mechanically coupled to at least one of the base module the first extension table, the third latch mechanism adapted to hold the third extension table in the stowed position to prevent the fourth bias force from moving the third extension table from the stowed position to the unstowed position while the at least one stack of bales is being accumulated on at least one of the load bed and the first extension table, and adapted to release the third extension table from the stowed position responsive to the bale transfer module transferring the at least one stack of bales across at least one of the load bed and the first extension table towards the third extension table to permit the third extension table to move from the stowed position to the unstowed position responsive to the



fourth bias force and to permit the at least one stack of bales to be transferred from the location on the first extension table adjacent to the third extension table to a location on the third extension table as the agricultural bale accumulator is transported across the ground surface.

5 130. An agricultural bale accumulator according to claim 128 wherein the third counterweight movement mechanism further comprises:

10 a fourth latch mechanism mechanically coupled to the third extension table and mechanically coupled to at least one of the base module the first extension table, the fourth latch mechanism adapted to hold the first extension table in the unstowed position to prevent the third  
15 bias force from moving the third extension table from the unstowed position to the stowed position while the at least one stack of bales is being accumulated on at least one of the load bed, the first extension table and the third extension table, and adapted to release the first extension table from the unstowed position responsive to a bale discharge module discharging the at least one stack of bales from the load bed, the first extension table and the third extension table to the  
20 ground surface to permit the third extension table to move from the unstowed position to the stowed position responsive to the third bias force.

131. An agricultural bale accumulator comprising:

25 a base module adapted to be supported by and transported across a ground surface, wherein the ground surface has a degree of levelness, relative to a horizontal plane, which varies across the ground surface, the base module including:

30 a load bed being substantially planar and having a measure of levelness, relative to the horizontal plane, which varies in accordance with the degree of levelness as the agricultural bale accumulator is transported across the ground surface, wherein the load bed is adapted to receive on the load bed a plurality of bales along a bale receiving axis, and wherein the load bed has a first side disposed essentially opposite to and essentially parallel to a second side of the load bed;

35 a bale transfer module adapted to transfer the plurality of bales across the load bed along a bale transfer axis horizontally transverse to the bale receiving axis responsive to the plurality of bales being received on the load bed to accumulate on the load bed the plurality of bales at predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, wherein an undesirable amount of the measure of levelness encourages the plurality of bales located at the predetermined positions on the load bed to move from the predetermined positions as the agricultural bale accumulator is transported across the ground surface;

a load bed leveling module including:

a level determining device adapted to determine the measure of levelness of the load bed relative to the horizontal plane as the agricultural bale accumulator is transported across the ground surface; and

a level controlling device adapted to change a leveling position, within a predetermined range of leveling positions, of the load bed relative to the horizontal plane responsive to the measure of levelness to compensate for the degree of levelness of the ground surface relative to the horizontal plane thereby encouraging the plurality of bales accumulated on the load bed located at the predetermined positions to remain located at the predetermined positions as the agricultural bale accumulator is transported across the ground surface; and

a lateral bale stabilization module including:

a first extension table which is substantially planar, wherein the first extension table has a first side disposed essentially opposite to and essentially parallel to a second side of the first extension table;

a first extension table attachment mechanism connected to the first side of the first extension table and the first side of the base module to permit the first extension table to be moveable relative to the base module between a stowed position and an unstowed position, wherein the agricultural bale accumulator has a first bale carrying capacity when the first extension table is in the stowed position by not permitting at least one bale of the plurality of bales to be received on the first extension table, and wherein the agricultural bale accumulator has a second bale carrying capacity, greater than the first bale carrying capacity, when the first extension table is in the unstowed position by permitting at least one bale of the plurality of bales to be received on the first extension table; and

a first extension table movement mechanism connected to the first extension table and the base module and adapted to move the first extension table relative to the base module between the stowed position and the unstowed position, wherein the first extension table movement mechanism is further adapted to maintain the first extension table in the stowed position to permit physical contact between at least a portion of the first extension table and at least one bale of the plurality of bales accumulated on the load bed at a location adjacent to the first extension table to encourage the plurality of bales located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, and adapted to move the first extension table from the stowed position to the unstowed position responsive to the bale transfer module transferring the plurality of bales across the load bed towards the first extension table to permit the at least one bale of the plurality of bales to be transferred from the location on the load bed adjacent to the first extension table to a location on the first extension table as the agricultural bale accumulator is transported across the ground surface.

132. An agricultural bale accumulator according to claim 131:

wherein the load bed has a longitudinal axis disposed substantially parallel to the bale receiving axis,

wherein the level determining device further comprises:

a longitudinal level determining device adapted to determine a first measure of levelness of the load bed along the longitudinal axis relative the horizontal plane as the agricultural bale accumulator is transported across the ground surface; and

wherein the level controlling device further comprises:

5 a longitudinal level controlling device adapted to change the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness to compensate for the degree of levelness of the ground surface along the longitudinal axis relative to the horizontal plane thereby encouraging the plurality of bales accumulated on the load bed located at the  
10 predetermined positions to remain located at the predetermined positions as the agricultural bale accumulator is transported across the ground surface.

133. An agricultural bale accumulator according to claim 132:

wherein the base module further comprises:

15 a frame mechanically coupled to the load bed and adapted to support the load bed above the ground surface, wherein the load bed has a lateral axis disposed substantially perpendicular to the longitudinal axis, wherein the load bed is mechanically coupled to the frame about a pivot axis disposed substantially parallel to the lateral axis, and

wherein the longitudinal level controlling device further comprises:

20 a first longitudinal level controlling device mechanically coupled to the frame and the load bed and adapted to pivot the load bed about the pivot axis responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

25 134. An agricultural bale accumulator according to claim 133:

wherein the frame has a forward end portion and a rear end portion disposed along the longitudinal axis as referenced to a forward traveling direction of the agricultural bale accumulator, wherein the load bed is mechanically coupled to the frame about the pivot axis at the rear end  
30 portion of the frame between a forward end portion of the load bed and a rear end portion of the load bed as referenced to the forward traveling direction of the agricultural bale accumulator, and wherein the forward end portion of the frame is disposed closer to the ground than the rear end portion of the frame as the agricultural bale accumulator is transported across the ground surface to permit the frame to be disposed at an acute angle relative to the ground surface with a closed  
35 end of the acute angle leading an open end of the acute angle as the agricultural bale accumulator is transported across the ground surface, and

wherein the level controlling device positions the load bed at an intermediate leveling position between a minimum leveling position and a maximum leveling position of the predetermined range of leveling positions when the ground surface and the load bed are  
40 substantially level with the horizontal plane to permit the first longitudinal level controlling device

to pivot the forward end portion of the load bed about the pivot axis in either a positive direction or a negative direction relative to the horizontal plane in correspondence with the rear end portion of the load bed being pivoted about the pivot axis in either the negative direction or the positive direction, respectively, relative to the horizontal plane, responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

135. An agricultural bale accumulator according to claim 133 wherein first longitudinal level controlling device is further adapted to pivot the load bed about the pivot axis between a bale receiving position and a bale discharging position relative to the frame, wherein the load bed assumes the leveling position, within the predetermined range of leveling positions, when the load bed is in the bale receiving position to permit the load bed to receive and accumulate thereon the plurality of bales, and wherein the load bed assumes an inclined position relative to the frame when the load bed is in the bale discharging position to permit the plurality of bales to be discharged from the load bed to the ground surface under a gravitational force acting on the plurality of bales.

136. An agricultural bale accumulator according to claim 131:

wherein the first extension table attachment mechanism further comprises a first hinge for pivotally connecting the first side of the first extension table to the first side of the base module about a first hinge axis, and

wherein the first extension table movement mechanism is adapted to cause the first extension table to pivot in an upward direction towards the base module about the first hinge axis so that the first extension table is disposed substantially perpendicular to the load bed and above a bale receiving surface of the load bed when the first extension table is in the stowed position, and is adapted to cause the first extension table to pivot in a downward direction away from the base module about the first hinge axis so that the first extension table is disposed substantially coplanar with the load bed and adjacent to the first side of the load bed when the first extension table is in the unstowed position.

137. An agricultural bale accumulator according to claim 131 wherein at least one of a portion of a bale receiving surface of the load bed, located between the first extension table and a substantially planar bale receiving surface of the load bed, and a bale receiving surface of the first extension table, located in the unstowed position, is disposed at an angle somewhat less than one hundred eighty degrees ( $180^\circ$ ) relative to the substantially planar bale receiving surface of the load bed to cause the at least one bale of the plurality of bales positioned on the at least one of the portion of a bale receiving surface of the load bed and the bale receiving surface of the first extension table, respectively, to lean in an inward direction towards the substantially planar bale receiving surface of the load bed to encourage the plurality of bales located at the predetermined

positions on the load bed and on the first extension table to remain located at the predetermined positions on the load bed and on the first extension table as the agricultural bale accumulator is transported across the ground surface.

- 5 1. A method for operating an agricultural bale accumulator comprising the steps of:  
receiving a plurality of bales on a load bed along a bale receiving axis, wherein the load  
bed forms a part of a base module of the agricultural bale accumulator adapted to be supported by  
and transported across a ground surface, wherein the ground surface has a degree of levelness,  
relative to a horizontal plane, which varies across the ground surface, and wherein the load bed is  
10 substantially planar and has a measure of levelness, relative to the horizontal plane, which varies  
in accordance with the degree of levelness as the agricultural bale accumulator is transported  
across the ground surface;

accumulating the plurality of bales on the load bed at predetermined positions on the load  
bed responsive to the step of receiving as the agricultural bale accumulator is transported across  
15 the ground surface, wherein an undesirable amount of the measure of levelness encourages the  
plurality of bales located at the predetermined positions on the load bed to move from the  
predetermined positions as the agricultural bale accumulator is transported across the ground  
surface; and

stabilizing the plurality of bales accumulated on the load bed responsive to the step of  
20 accumulating to encourage the plurality of bales accumulated on the load bed located at the  
predetermined positions on the load bed to remain located at the predetermined positions on the  
load bed as the agricultural bale accumulator is transported across the ground surface.

- 25 2. A method according to claim 1 wherein the step of stabilizing further comprises the steps  
of:

determining the measure of levelness of the load bed relative to the horizontal plane as the  
agricultural bale accumulator is transported across the ground surface; and

changing a leveling position, within a predetermined range of leveling positions, of the  
load bed relative to the horizontal plane responsive to the measure of levelness to compensate for  
30 the degree of levelness of the ground surface relative to the horizontal plane thereby encouraging  
the plurality of bales accumulated on the load bed located at the predetermined positions to remain  
located at the predetermined positions as the agricultural bale accumulator is transported across the  
ground surface.

- 35 3. A method according to claim 2

wherein the step of determining the measure of levelness of the load bed relative to the  
horizontal plane further comprises the step of:

determining a first measure of levelness of the load bed along a longitudinal axis,  
disposed substantially parallel to the bale receiving axis, relative the horizontal plane as the  
40 agricultural bale accumulator is transported across the ground surface; and

wherein the step of changing a leveling position, within the predetermined range of leveling positions, of the load bed relative to the horizontal plane further comprises the step of:

changing the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness to compensate for the degree of levelness of the ground surface along the longitudinal axis relative to the horizontal plane.

4. A method according to claim 3 further comprising the steps of:

determining whether the first measure of levelness is desirable or undesirable;

maintaining the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative the horizontal plane responsive to a determination that the first measure of levelness is desirable; and

changing the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative the horizontal plane responsive to a determination that the first measure of levelness is undesirable.

5. A method according to claim 3 further comprising the steps of:

determining whether the first measure of levelness has reached a maximum adjustment limit within the predetermined range of leveling positions along the longitudinal axis;

maintaining the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative the horizontal plane responsive to a determination that the first measure of levelness has reached the maximum adjustment limit within the predetermined range of leveling positions along the longitudinal axis; and

changing the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative the horizontal plane responsive to a determination that the first measure of levelness has not reached the maximum adjustment limit within the predetermined range of leveling positions along the longitudinal axis.

6. A method according to claim 3 wherein the step of changing the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane further comprises the step of:

pivoting the load bed about a pivot axis, disposed substantially perpendicular to the longitudinal axis and disposed substantially parallel to a lateral axis of the load bed, relative to a frame of the base module responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

7. A method according to claim 6 wherein the step of pivoting the load bed about the pivot axis relative to the frame further comprises the step of:

pivoting the load bed about the pivot axis relative to the frame in one of a positive direction or a negative direction relative to the horizontal plane responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

8. A method according to claim 6 wherein the step of pivoting the load bed about the pivot axis relative to the frame further comprises the step of:

pivoting the load bed about the pivot axis between a bale receiving position and a bale discharging position relative to the frame, wherein the load bed assumes the leveling position, within the predetermined range of leveling positions, when the load bed is in the bale receiving position to permit the load bed to receive and accumulate thereon the plurality of bales, and wherein the load bed assumes an inclined position relative to the frame when the load bed is in the bale discharging position to permit the plurality of bales to be discharged from the load bed to the ground surface under a gravitational force acting on the plurality of bales.

9. A method according to claim 3 wherein the step of changing the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane further comprises the step of:

changing a frame leveling position, within a predetermined range of frame leveling positions, of a forward end portion of a frame, supporting the load bed above the ground surface, relative to a hitch on towing unit, pulling the agricultural bale accumulator in tandem behind the towing unit across the ground surface, responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

10. A method according to claim 2

wherein the step of determining the measure of levelness of the load bed relative to the horizontal plane further comprises the step of:

determining a second measure of levelness of the load bed along a lateral axis, disposed substantially perpendicular to the bale receiving axis, relative the horizontal plane as the agricultural bale accumulator is transported across the ground surface; and

wherein the step of changing a leveling position, within the predetermined range of leveling positions, of the load bed relative to the horizontal plane further comprises the step of:

changing the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness to compensate for the degree of levelness of the ground surface along the lateral axis relative to the horizontal plane.

11. A method according to claim 10 further comprising the steps of:

determining whether the second measure of levelness is desirable or undesirable;

maintaining the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative the horizontal plane responsive to a determination that the second measure of levelness is desirable; and

changing the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative the horizontal plane responsive to a determination that the second measure of levelness is undesirable.

12. A method according to claim 10 further comprising the steps of:

determining whether the second measure of levelness has reached a maximum adjustment limit within the predetermined range of leveling positions along the lateral axis responsive to the step of determining that the second measure of levelness is undesirable;

when it is determined that the second measure of levelness has reached a maximum adjustment limit within the predetermined range of leveling positions along the lateral axis, then perform the step of:

determining whether the load bed has any bale accumulating capacity remaining at a location on the load bed along the lateral axis which needs to be changed relative to the horizontal plane;

accumulating the plurality of bales on the load bed at a location along the lateral axis

when it is determined that the second measure of levelness has not reached the maximum adjustment limit within the predetermined range of leveling positions along the lateral axis, then perform the steps of:

maintaining the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative the horizontal plane;

accumulating the plurality of bales on the load bed at any location along the lateral axis.

changing the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative the horizontal plane responsive to a determination that the second measure of levelness has not reached the maximum adjustment limit within the predetermined range of leveling positions along the lateral axis.

11. A method according to claim 9 wherein the step of changing the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane further comprises the step of:



changing a frame leveling position, within a predetermined range of frame leveling positions, of a first side of a frame, forming a part of the base module and supporting the load bed above the ground surface, relative to a first support wheel, mechanically coupled to a first side of the frame, supporting the frame above the ground surface and permitting the agricultural bale accumulator to travel across the ground surface, responsive to the second measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness; and

changing the frame leveling position, within the predetermined range of the frame leveling positions, of the second side of the frame relative to a second support wheel, mechanically coupled to a second side of the frame, supporting the frame above the ground surface and permitting the agricultural bale accumulator to travel across the ground surface, responsive to the second measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness

12. A method according to claim 1 wherein the step of accumulating further comprises the step of:

transferring the plurality of bales across the load bed along a bale transferring axis disposed horizontally traverse to the bale receiving axis responsive to receiving the plurality of bales on the load bed to permit the agricultural bale accumulator to accumulate the plurality of bales in a side-by-side relationship on the load bed.

13. A method according to claim 1 wherein the step of accumulating further comprises the step of:

forming at least one stack of bales, having at least two bales, along a bale stacking axis disposed vertically transverse to the bale receiving axis responsive to receiving the plurality of bales on the load bed to permit the agricultural bale accumulator to accumulate the at least one stack of bales on the load bed.

14. A method for operating an agricultural bale accumulator comprising the steps of:

receiving a plurality of bales on a load bed along a bale receiving axis, wherein the load bed forms a part of a base module of the agricultural bale accumulator adapted to be supported by and transported across a ground surface, wherein the ground surface has a degree of levelness, relative to a horizontal plane, which varies across the ground surface, and wherein the load bed is substantially planar and has a measure of levelness, relative to the horizontal plane, which varies in accordance with the degree of levelness as the agricultural bale accumulator is transported across the ground surface;

accumulating the plurality of bales on the load bed at predetermined positions on the load bed responsive to the step of receiving as the agricultural bale accumulator is transported across

the ground surface, wherein an undesirable amount of the measure of levelness encourages the plurality of bales located at the predetermined positions on the load bed to move from the predetermined positions as the agricultural bale accumulator is transported across the ground surface; and

5        stabilizing the plurality of bales accumulated on the load bed responsive to the step of accumulating to encourage the plurality of bales accumulated on the load bed located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, wherein the step of stabilizing further comprises the steps of:

10        determining the measure of levelness of the load bed relative to the horizontal plane as the agricultural bale accumulator is transported across the ground surface, wherein the step of determining further comprises the steps of:

15        determining a first measure of levelness of the load bed along a longitudinal axis, disposed substantially parallel to the bale receiving axis, relative the horizontal plane as the agricultural bale accumulator is transported across the ground surface; and

      determining a second measure of levelness of the load bed along a lateral axis, disposed substantially perpendicular to the bale receiving axis and the longitudinal axis, relative the horizontal plane as the agricultural bale accumulator is transported across the ground surface; and

20        changing a leveling position, within a predetermined range of leveling positions, of the load bed relative to the horizontal plane responsive to the measure of levelness to compensate for the degree of levelness of the ground surface relative to the horizontal plane thereby encouraging the plurality of bales accumulated on the load bed located at the predetermined positions to remain located at the predetermined positions as the agricultural bale accumulator is  
25 transported across the ground surface, wherein the step of changing further comprises the steps of:

30        changing the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness to compensate for the degree of levelness of the ground surface along the longitudinal axis relative to the horizontal plane; and

      changing the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness to compensate for the degree of levelness of the ground surface along the lateral axis relative to the horizontal plane.

35

15.    A method according to claim 14 further comprising the step of:

      determining whether the first measure of levelness is desirable or undesirable;

      maintaining the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative the horizontal plane responsive to a determination  
40 that the first measure of levelness is desirable; and

changing the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative the horizontal plane responsive to a determination that the first measure of levelness is undesirable.

- 5 16. A method according to claim 14 wherein the step of changing the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane further comprises the step of:

10 pivoting the load bed about a pivot axis, disposed substantially perpendicular to the longitudinal axis and disposed substantially parallel to a lateral axis of the load bed, relative to a frame of the base module responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

- 15 17. A method according to claim 16 wherein the step of pivoting the load bed about the pivot axis relative to the frame further comprises the step of:

20 pivoting the load bed about the pivot axis relative to the frame in one of a positive direction or a negative direction relative to the horizontal plane responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

18. A method according to claim 16 wherein the step of pivoting the load bed about the pivot axis relative to the frame further comprises the step of:

25 pivoting the load bed about the pivot axis between a bale receiving position and a bale discharging position relative to the frame, wherein the load bed assumes the leveling position, within the predetermined range of leveling positions, when the load bed is in the bale receiving position to permit the load bed to receive and accumulate thereon the plurality of bales, and wherein the load bed assumes an inclined position relative to the frame when the load bed is in the bale discharging position to permit the plurality of bales to be discharged from the load bed to the  
30 ground surface under a gravitational force acting on the plurality of bales.

19. A method according to claim 14 wherein the step of changing the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane further comprises the step of:

35 changing a frame leveling position, within a predetermined range of frame leveling positions, of a forward end portion of a frame, supporting the load bed above the ground surface, relative to a hitch on towing unit, pulling the agricultural bale accumulator in tandem behind the towing unit across the ground surface, responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the

load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

20. A method according to claim 14 further comprising the step of:

5 determining whether the second measure of levelness is desirable or undesirable;

maintaining the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative the horizontal plane responsive to a determination that the second measure of levelness is desirable; and

10 changing the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative the horizontal plane responsive to a determination that the second measure of levelness is undesirable.

21. A method according to claim 20 wherein the step of changing the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the  
15 horizontal plane further comprises the step of:

changing a frame leveling position, within a predetermined range of frame leveling positions, of a first side of a frame, forming a part of the base module and supporting the load bed above the ground surface, relative to a first support wheel, mechanically coupled to a first side of the frame, supporting the frame above the ground surface and permitting the agricultural bale  
20 accumulator to travel across the ground surface, responsive to the second measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness; and

25 changing the frame leveling position, within the predetermined range of the frame leveling positions, of the second side of the frame relative to a second support wheel, mechanically coupled to a second side of the frame, supporting the frame above the ground surface and permitting the agricultural bale accumulator to travel across the ground surface, responsive to the second measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the  
30 horizontal plane responsive to the second measure of levelness

22. A method according to claim 14 wherein the step of accumulating further comprises the step of:

35 transferring the plurality of bales across the load bed along a bale transferring axis disposed horizontally traverse to the bale receiving axis responsive to receiving the plurality of bales on the load bed to permit the agricultural bale accumulator to accumulate the plurality of bales in a side-by-side relationship on the load bed.

23. A method according to claim 14 wherein the step of accumulating further comprises the  
40 step of:

forming at least one stack of bales, having at least two bales, along a bale stacking axis disposed vertically transverse to the bale receiving axis responsive to receiving the plurality of bales on the load bed to permit the agricultural bale accumulator to accumulate the at least one stack of bales on the load bed.

5

24. A method for operating an agricultural bale accumulator comprising the steps of:

receiving a plurality of bales on a load bed along a bale receiving axis, wherein the load bed forms a part of a base module of the agricultural bale accumulator adapted to be supported by and transported across a ground surface, wherein the ground surface has a degree of levelness, relative to a horizontal plane, which varies across the ground surface, and wherein the load bed is substantially planar and has a measure of levelness, relative to the horizontal plane, which varies in accordance with the degree of levelness as the agricultural bale accumulator is transported across the ground surface;

accumulating the plurality of bales on the load bed at predetermined positions on the load bed responsive to the step of receiving as the agricultural bale accumulator is transported across the ground surface, wherein an undesirable amount of the measure of levelness encourages the plurality of bales located at the predetermined positions on the load bed to move from the predetermined positions as the agricultural bale accumulator is transported across the ground surface, wherein the step of accumulating further comprises the steps of:

forming at least one stack of bales, having at least two bales, along a bale stacking axis, disposed vertically transverse to the bale receiving axis, responsive to receiving the plurality of bales on the load bed to permit the agricultural bale accumulator to accumulate the at least one stack of bales on the load bed; and

transferring the at least one stack of bales across the load bed along a bale transferring axis, disposed horizontally transverse to the bale receiving axis and the bale stacking axis, responsive to receiving the at least one stack of bales on the load bed to permit the agricultural bale accumulator to accumulate the at least one stack of bales in a side-by-side relationship on the load bed; and

stabilizing the at least one stack of bales accumulated on the load bed responsive to the step of accumulating to encourage the plurality of bales accumulated on the load bed located at the predetermined positions on the load bed to remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, wherein the step of stabilizing further comprises the steps of:

determining the measure of levelness of the load bed relative to the horizontal plane as the agricultural bale accumulator is transported across the ground surface, wherein the step of determining further comprises the steps of:

determining a first measure of levelness of the load bed along a longitudinal axis, disposed substantially parallel to the bale receiving axis, relative the horizontal plane as the agricultural bale accumulator is transported across the ground surface; and

determining a second measure of levelness of the load bed along a lateral axis, disposed substantially perpendicular to the bale receiving axis and the longitudinal axis, relative the horizontal plane as the agricultural bale accumulator is transported across the ground surface; and

5 changing a leveling position, within a predetermined range of leveling positions, of the load bed relative to the horizontal plane responsive to the measure of levelness to compensate for the degree of levelness of the ground surface relative to the horizontal plane thereby encouraging the plurality of bales accumulated on the load bed located at the predetermined positions to remain located at the predetermined positions as the agricultural bale accumulator is  
10 transported across the ground surface, wherein the step of changing further comprises the steps of:

changing the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness to compensate for the degree of levelness of the ground surface  
15 along the longitudinal axis relative to the horizontal plane; and

changing the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness to compensate for the degree of levelness of the ground surface along the lateral axis relative to the horizontal plane.

20 25. A method according to claim 24 further comprising the step of:

determining whether the first measure of levelness is desirable or undesirable;

maintaining the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative the horizontal plane responsive to a determination  
25 that the first measure of levelness is desirable; and

changing the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative the horizontal plane responsive to a determination that the first measure of levelness is undesirable.

30 26. A method according to claim 24 wherein the step of changing the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane further comprises the step of:

pivoting the load bed about a pivot axis, disposed substantially perpendicular to the longitudinal axis and disposed substantially parallel to a lateral axis of the load bed, relative to a  
35 frame of the base module responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

27. A method according to claim 26 wherein the step of pivoting the load bed about the pivot  
40 axis relative to the frame further comprises the step of:

pivoting the load bed about the pivot axis relative to the frame in one of a positive direction or a negative direction relative to the horizontal plane responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

28. A method according to claim 26 wherein the step of pivoting the load bed about the pivot axis relative to the frame further comprises the step of:

pivoting the load bed about the pivot axis between a bale receiving position and a bale discharging position relative to the frame, wherein the load bed assumes the leveling position, within the predetermined range of leveling positions, when the load bed is in the bale receiving position to permit the load bed to receive and accumulate thereon the plurality of bales, and wherein the load bed assumes an inclined position relative to the frame when the load bed is in the bale discharging position to permit the plurality of bales to be discharged from the load bed to the ground surface under a gravitational force acting on the plurality of bales.

29. A method according to claim 24 wherein the step of changing the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane further comprises the step of:

changing a frame leveling position, within a predetermined range of frame leveling positions, of a forward end portion of a frame, supporting the load bed above the ground surface, relative to a hitch on towing unit, pulling the agricultural bale accumulator in tandem behind the towing unit across the ground surface, responsive to the first measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the longitudinal axis relative to the horizontal plane responsive to the first measure of levelness.

30. A method according to claim 24 further comprising the step of:

determining whether the second measure of levelness is desirable or undesirable;

maintaining the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative the horizontal plane responsive to a determination that the second measure of levelness is desirable; and

changing the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative the horizontal plane responsive to a determination that the second measure of levelness is undesirable.

31. A method according to claim 30 wherein the step of changing the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane further comprises the step of:

changing a frame leveling position, within a predetermined range of frame leveling positions, of a first side of a frame, forming a part of the base module and supporting the load bed above the ground surface, relative to a first support wheel, mechanically coupled to a first side of the frame, supporting the frame above the ground surface and permitting the agricultural bale accumulator to travel across the ground surface, responsive to the second measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness; and

changing the frame leveling position, within the predetermined range of the frame leveling positions, of the second side of the frame relative to a second support wheel, mechanically coupled to a second side of the frame, supporting the frame above the ground surface and permitting the agricultural bale accumulator to travel across the ground surface, responsive to the second measure of levelness to effectuate the change of the leveling position, within the predetermined range of leveling positions, of the load bed along the lateral axis relative to the horizontal plane responsive to the second measure of levelness.

1. An agricultural bale accumulator comprising:

a base module adapted to be supported by and transported across a ground surface, wherein the ground surface has a degree of levelness, relative to a horizontal plane, which varies across the ground surface, the base module including:

a load bed being substantially planar and having a measure of levelness, relative to the horizontal plane, which varies in accordance with the degree of levelness as the agricultural bale accumulator is transported across the ground surface, wherein the load bed is adapted to receive on the load bed a plurality of bales along a bale receiving axis, and wherein the load bed has a first side disposed essentially opposite to and essentially parallel to a second side of the load bed;

a bale transfer module adapted to transfer the plurality of bales across the load bed along a bale transfer axis horizontally transverse to the bale receiving axis responsive to the plurality of bales being received on the load bed to accumulate on the load bed the plurality of bales at predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, wherein an undesirable amount of the measure of levelness encourages the plurality of bales located at the predetermined positions on the load bed to move from the predetermined positions as the agricultural bale accumulator is transported across the ground surface;

a load bed leveling module including:

a level determining device adapted to determine the measure of levelness of the load bed relative to the horizontal plane as the agricultural bale accumulator is transported across the ground surface; and

a level controlling device adapted to change a leveling position, within a predetermined range of leveling positions, of the load bed relative to the horizontal plane



responsive to the measure of levelness to compensate for the degree of levelness of the ground surface relative to the horizontal plane thereby encouraging the plurality of bales accumulated on the load bed located at the predetermined positions to remain located at the predetermined positions as the agricultural bale accumulator is transported across the ground surface; and

5 a lateral bale stabilization module including:

a first extension table which is substantially planar, wherein the first extension table has a first side disposed essentially opposite to and essentially parallel to a second side of the first extension table;

10 a first extension table attachment mechanism connected to the first side of the first extension table and the first side of the base module to permit the first extension table to be moveable relative to the base module between a stowed position and an unstowed position, wherein the agricultural bale accumulator has a first bale carrying capacity when the first extension table is in the stowed position by not permitting at least one bale of the plurality of bales to be received on the first extension table, and wherein the agricultural bale accumulator has a second  
15 bale carrying capacity, greater than the first bale carrying capacity, when the first extension table is in the unstowed position by permitting at least one bale of the plurality of bales to be received on the first extension table; and

a first extension table movement mechanism connected to the first extension table and the base module and adapted to move the first extension table relative to the base module  
20 between the stowed position and the unstowed position, wherein the first extension table movement mechanism is further adapted to maintain the first extension table in the stowed position to permit physical contact between at least a portion of the first extension table and at least one bale of the plurality of bales accumulated on the load bed at a location adjacent to the first extension table to encourage the plurality of bales located at the predetermined positions on the load bed to  
25 remain located at the predetermined positions on the load bed as the agricultural bale accumulator is transported across the ground surface, and adapted to move the first extension table from the stowed position to the unstowed position responsive to the bale transfer module transferring the plurality of bales across the load bed towards the first extension table to permit the at least one bale of the plurality of bales to be transferred from the location on the load bed adjacent to the first  
30 extension table to a location on the first extension table as the agricultural bale accumulator is transported across the ground surface.

#### Permissive Bale Discharge Module

35 1. An agricultural bale accumulator comprising:

a frame supported above a ground surface;

a load bed being substantially planar and being supported by the frame, wherein the load bed is adapted to receive thereon a plurality of bales at a first rate of speed along a bale receiving axis in a bale receiving direction to accumulate thereon the plurality of bales, and wherein the load

bed has an entry region designating a part of the load bed where the plurality of bales are first received on the load bed;

a bale discharge module adapted to discharge the plurality of bales accumulated on the load bed to the ground surface, the bale discharge module further comprising:

5 a pivot mechanism mechanically coupled to the frame and the load bed and adapted to pivot the load bed between a bale receiving position and a bale discharging position, wherein the load bed is located in a horizontal position relative to the frame when the load bed is located in the bale receiving position, wherein the load bed is located in an inclined position relative to the frame when the load bed is located in the bale discharging position, and wherein the pivot  
10 mechanism pivots the load bed relative to the frame from the bale receiving position to the bale discharging position to discharge the plurality of bales accumulated on the load bed to the ground surface under a gravitational force acting on the plurality of bales; and

a bale support member mechanically coupled to the load bed at the entry region of the load bed along the bale receiving path, disposed between the plurality of bales to be received on the  
15 load bed and the entry region of the load bed and moveable between a bale supporting position and a bale clearing position, wherein the bale support member is adapted to support each of the plurality of bales before they are first received at the entry region of the load bed when the bale support member is located in the bale supporting position and when the load bed is located in the bale receiving position, wherein the bale support member is adapted to move to the bale clearing  
20 position before the load bed returns from the bale discharging position to the bale receiving position to create a space having a predetermined distance along the bale receiving axis between a next bale of the plurality of bales to be received on the load bed and the entry region of the load bed so that the bale support member does not interfere with the next bale of the plurality of bales to be received on the load bed when the load bed returns from the bale discharging position to the  
25 bale receiving position, and wherein the load bed moves from the bale receiving position to the bale discharging position and back to the bale receiving position in a first amount of time less than a second amount of time required for the next bale of the plurality of bales to move through the predetermined distance at the first rate of speed along the bale receiving path.

30 Hinged Door:

1. An agricultural bale accumulator comprising:  
a frame supported above a ground surface;

a load bed being substantially planar and being supported by the frame, wherein the load bed is adapted to receive thereon a plurality of bales at a first rate of speed along a bale receiving axis in a bale receiving direction to accumulate thereon the plurality of bales, and wherein the load  
35 bed has an entry region designating a part of the load bed where the plurality of bales are first received on the load bed;

a bale discharge module adapted to discharge the plurality of bales accumulated on the load bed to the ground surface, the bale discharge module further comprising:

a pivot mechanism mechanically coupled to the frame and the load bed and adapted to pivot the load bed between a bale receiving position and a bale discharging position, wherein the load bed is located in a horizontal position relative to the frame when the load bed is located in the bale receiving position, wherein the load bed is located in an inclined position relative to the frame when the load bed is located in the bale discharging position, and wherein the pivot mechanism pivots the load bed relative to the frame from the bale receiving position to the bale discharging position to discharge the plurality of bales accumulated on the load bed to the ground surface under a gravitational force acting on the plurality of bales; and

a bale support member mechanically coupled to the load bed at the entry region of the load bed along the bale receiving path, disposed between the plurality of bales to be received on the load bed and the entry region of the load bed and moveable between a bale supporting position and a bale clearing position, wherein the bale support member is adapted to support each of the plurality of bales before they are first received at the entry region of the load bed when the bale support member is located in the bale supporting position and when the load bed is located in the bale receiving position, wherein the bale support member is adapted to move to the bale clearing position before the load bed returns from the bale discharging position to the bale receiving position to create a space having a predetermined distance along the bale receiving axis between a next bale of the plurality of bales to be received on the load bed and the entry region of the load bed so that the bale support member does not interfere with the next bale of the plurality of bales to be received on the load bed when the load bed returns from the bale discharging position to the bale receiving position, and wherein the load bed moves from the bale receiving position to the bale discharging position and back to the bale receiving position in a first amount of time less than a second amount of time required for the next bale of the plurality of bales to move through the predetermined distance at the first rate of speed along the bale receiving path.

2. An agricultural bale accumulator according to claim 1:

wherein the agricultural bale accumulator is adapted to be pulled in tandem behind an agricultural baler in an accumulator traveling direction across the ground surface,

wherein the plurality of bales, including a first bale followed by a second bale, are successively ejected from a bale chamber of the agricultural baler at the first rate of speed along the bale receiving axis in the bale receiving direction essentially opposite to the accumulator traveling direction,

wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the load bed along the bale receiving axis in the bale traveling direction, and

wherein each of the plurality of bales are received on the load bed along the bale receiving axis to accumulate thereon each of the plurality of bales responsive to each of the plurality of bales being completely formed and ejected from the bale chamber of the agricultural baler.

3. An agricultural bale accumulator according to claim 1 further comprising:

a bale transfer module adapted to distribute each of the plurality of bales received on the load bed across the load bed along a bale distributing axis horizontally traverse to the bale receiving axis to position the plurality of bales received on the load bed in a side-by-side relationship on the load bed to accumulate a predetermined number of the plurality of bales on the load bed; and

a load bed capacity sensor adapted to determine that the load bed has accumulated the predetermined number of the plurality of bales on the load bed,

wherein the bale discharge module discharges the plurality of bales accumulated on the load bed to the ground surface responsive to a determination by the load bed capacity sensor that the load bed has accumulated the predetermined number of the plurality of bales on the load bed.

4. An agricultural bale accumulator according to claim 1 further comprising:

a bale support member movement mechanism adapted to cause the bale support member to move from the bale supporting position to the bale clearing position responsive to the load bed being moved from the bale receiving position to the bale discharging position and adapted to cause the bale support member to move from the bale clearing position to the bale supporting position responsive to the load bed being moved from the bale discharging position to the bale receiving position.

5. An agricultural bale accumulator according to claim 1 wherein the load bed further comprises:

a notch formed in a side of the load bed at the entry region of the load bed along the bale receiving path, wherein the notch is disposed between the plurality of bales to be received on the load bed and the entry region of the load bed, and

wherein the bale support member is disposed in the notch when the bale support member is located in the bale supporting position, and wherein the bale support member is not disposed in the notch when the bale support member is located in the bale clearing position.

6. An agricultural bale accumulator according to claim 1 wherein the bale support member further comprises:

at least one substantially planar plate.

7. An agricultural bale accumulator according to claim 1 wherein the bale support member further comprises:

at least one elongated bar.

8. An agricultural bale accumulator according to claim 1 wherein the agricultural bale accumulator further comprises:

a hinge mechanism mechanically coupled to the load bed at the entry region of the load bed along the bale receiving axis and having a hinge axis, wherein the hinge mechanism is adapted to mechanically couple the bale support member to the load bed about the hinge axis, wherein the bale support member is permitted to rotate about the hinge axis between the bale supporting position and the bale clearing position.

9. An agricultural bale accumulator according to claim 1 wherein the agricultural bale accumulator further comprises:

a slide mechanism mechanically coupled to the load bed at the entry region of the load bed along the bale receiving axis and having a slide axis, wherein the hinge mechanism is adapted to mechanically couple the bale support member to the load bed about the slide axis, wherein the bale support member is permitted to slide along the slide axis between the bale supporting position and the bale clearing position.

10. An agricultural bale accumulator according to claim 1:

wherein the bale support member is disposed substantially coplanar with the load bed when the bale support member is located in the bale supporting position, and

wherein the bale support member is disposed beneath the load bed, opposite to a bale accumulating surface of the load bed, when the bale support member is located in the bale clearing position.

11. An agricultural bale accumulator adapted to be pulled in tandem behind an agricultural baler in an accumulator traveling direction across a ground surface, the agricultural bale accumulator comprising:

a frame supported above the ground surface;

a load bed being substantially planar and being supported by the frame, wherein the load bed is adapted to receive thereon a plurality of bales, including a first bale followed by a second bale, successively ejected from a bale chamber of the agricultural baler at a first rate of speed along a bale receiving axis in a bale receiving direction essentially opposite to the accumulator traveling direction, wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the load bed along the bale receiving axis in the bale receiving direction, wherein each of the plurality of bales are received on the load bed along the bale receiving axis responsive to each of the plurality of bales being completely formed and ejected from the bale chamber of the agricultural baler, and wherein the load bed has an entry region designating a part of the load bed where the plurality of bales are first received in the bale receiving direction along the bale receiving axis;

a bale transfer module adapted to distribute each of the plurality of bales received on the load bed across the load bed along a bale distributing axis horizontally traverse to the bale receiving axis to position the plurality of bales received on the load bed in a side-by-side

relationship on the load bed to accumulate a predetermined number of the plurality of bales on the load bed; and

a load bed capacity sensor adapted to determine that the load bed has accumulated the predetermined number of the plurality of bales on the load bed;

5 a bale discharge module adapted to discharge the plurality of bales accumulated on the load bed to the ground surface responsive to a determination by the load bed capacity sensor that the load bed has accumulated the predetermined number of the plurality of bales on the load bed, the bale discharge module further comprising:

10 a pivot mechanism mechanically coupled to the frame and the load bed and adapted to pivot the load bed between a bale receiving position and a bale discharging position, wherein the load bed is located in a horizontal position relative to the frame when the load bed is located in the bale receiving position, wherein the load bed is located in an inclined position relative to the frame when the load bed is located in the bale discharging position, and wherein the pivot mechanism pivots the load bed relative to the frame from the bale receiving position to the bale  
15 discharging position to discharge the plurality of bales accumulated on the load bed to the ground surface under a gravitational force acting on the plurality of bales; and

a bale support member mechanically coupled to the load bed at the entry region of the load bed along the bale receiving path, disposed between the plurality of bales to be received on the load bed and the entry region of the load bed and moveable between a bale supporting position and a bale clearing position, wherein the bale support member is adapted to support each of the  
20 plurality of bales before they are first received at the entry region of the load bed when the bale support member is located in the bale supporting position and when the load bed is located in the bale receiving position, wherein the bale support member is adapted to move to the bale clearing position before the load bed returns from the bale discharging position to the bale receiving position to create a space having a predetermined distance along the bale receiving axis between a  
25 next bale of the plurality of bales to be received on the load bed and the entry region of the load bed so that the bale support member does not interfere with the next bale of the plurality of bales to be received on the load bed when the load bed returns from the bale discharging position to the bale receiving position, and wherein the load bed moves from the bale receiving position to the  
30 bale discharging position and back to the bale receiving position in a first amount of time less than a second amount of time required for the next bale of the plurality of bales to move through the predetermined distance at the first rate of speed along the bale receiving path.

12. An agricultural bale accumulator according to claim 11 further comprising:

35 a bale support member movement mechanism adapted to cause the bale support member to move from the bale supporting position to the bale clearing position responsive to the load bed being moved from the bale receiving position to the bale discharging position and adapted to cause the bale support member to move from the bale clearing position to the bale supporting position responsive to the load bed being moved from the bale discharging position to the bale  
40 receiving position.

13. An agricultural bale accumulator according to claim 11 wherein the load bed further comprises:

5 a notch formed in a side of the load bed at the entry region of the load bed along the bale receiving path, wherein the notch is disposed between the plurality of bales to be received on the load bed and the entry region of the load bed, and

wherein the bale support member is disposed in the notch when the bale support member is located in the bale supporting position, and wherein the bale support member is not disposed in the notch when the bale support member is located in the bale clearing position.

10 14. An agricultural bale accumulator according to claim 11 wherein the bale support member further comprises:

at least one substantially planar plate.

15 15. An agricultural bale accumulator according to claim 11 wherein the bale support member further comprises:

at least one elongated bar.

20 16. An agricultural bale accumulator according to claim 11 wherein the agricultural bale accumulator further comprises:

25 a hinge mechanism mechanically coupled to the load bed at the entry region of the load bed along the bale receiving axis and having a hinge axis, wherein the hinge mechanism is adapted to mechanically couple the bale support member to the load bed about the hinge axis, wherein the bale support member is permitted to rotate about the hinge axis between the bale supporting position and the bale clearing position.

17. An agricultural bale accumulator according to claim 11 wherein the agricultural bale accumulator further comprises:

30 a slide mechanism mechanically coupled to the load bed at the entry region of the load bed along the bale receiving axis and having a slide axis, wherein the hinge mechanism is adapted to mechanically couple the bale support member to the load bed about the slide axis, wherein the bale support member is permitted to slide along the slide axis between the bale supporting position and the bale clearing position.

35 18. An agricultural bale accumulator according to claim 11:

wherein the bale support member is disposed substantially coplanar with the load bed when the bale support member is located in the bale supporting position, and

40 wherein the bale support member is disposed beneath the load bed, opposite to a bale accumulating surface of the load bed, when the bale support member is located in the bale clearing position.

19. An agricultural bale accumulator adapted to be pulled in tandem behind an agricultural baler in an accumulator traveling direction across a ground surface, the agricultural bale accumulator comprising:

5 a frame supported above the ground surface;

a load bed being substantially planar and being supported by the frame, wherein the load bed is adapted to receive thereon a plurality of bales, including a first bale followed by a second bale, successively ejected from a bale chamber of the agricultural baler at a first rate of speed along a bale receiving axis in a bale receiving direction essentially opposite to the accumulator traveling  
10 direction, wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the load bed along the bale receiving axis in the bale receiving direction, wherein each of the plurality of bales are received on the load bed along the bale receiving axis responsive to each of the plurality of bales being completely formed and ejected from the bale chamber of the agricultural baler, wherein the  
15 load bed has an entry region designating a part of the load bed where the plurality of bales are first received in the bale receiving direction along the bale receiving axis, wherein the load bed comprises a notch formed in a side of the load bed at the entry region of the load bed along the bale receiving axis, wherein the notch is disposed between the plurality of bales to be received on the load bed and the entry region of the load bed;

20 a bale transfer module adapted to distribute each of the plurality of bales received on the load bed across the load bed along a bale distributing axis horizontally traverse to the bale receiving axis to position the plurality of bales received on the load bed in a side-by-side relationship on the load bed to accumulate a predetermined number of the plurality of bales on the load bed; and

25 a load bed capacity sensor adapted to determine that the load bed has accumulated the predetermined number of the plurality of bales on the load bed;

a bale discharge module adapted to discharge the plurality of bales accumulated on the load bed to the ground surface responsive to a determination by the load bed capacity sensor that the load bed has accumulated the predetermined number of the plurality of bales on the load bed, the  
30 bale discharge module further comprising:

a pivot mechanism mechanically coupled to the frame and the load bed and adapted to pivot the load bed between a bale receiving position and a bale discharging position, wherein the load bed is located in a horizontal position relative to the frame when the load bed is located in the bale receiving position, wherein the load bed is located in an inclined position relative to the  
35 frame when the load bed is located in the bale discharging position, and wherein the pivot mechanism pivots the load bed relative to the frame from the bale receiving position to the bale discharging position to discharge the plurality of bales accumulated on the load bed to the ground surface under a gravitational force acting on the plurality of bales; and

a bale support member mechanically coupled to the load bed at the entry region of the load  
40 bed along the bale receiving path, disposed between the plurality of bales to be received on the



load bed and the entry region of the load bed and moveable between a bale supporting position and a bale clearing position, wherein the bale support member is disposed in the notch substantially coplanar with the load bed and is adapted to support each of the plurality of bales before they are first received at the entry region of the load bed when the bale support member is located in the bale supporting position and when the load bed is located in the bale receiving position, wherein the bale support member is not disposed in the notch beneath the load bed, opposite to a bale accumulating surface of the load bed, when the bale support member is located in the bale clearing position before the load bed returns from the bale discharging position to the bale receiving position to create a space having a predetermined distance along the bale receiving axis between a next bale of the plurality of bales to be received on the load bed and the entry region of the load bed so that the bale support member does not interfere with the next bale of the plurality of bales to be received on the load bed when the load bed returns from the bale discharging position to the bale receiving position, and wherein the load bed moves from the bale receiving position to the bale discharging position and back to the bale receiving position in a first amount of time less than a second amount of time required for the next bale of the plurality of bales to move through the predetermined distance at the first rate of speed along the bale receiving path.

20. An agricultural bale accumulator according to claim 19 further comprising:

a bale support member movement mechanism adapted to cause the bale support member to move from the bale supporting position to the bale clearing position responsive to the load bed being moved from the bale receiving position to the bale discharging position and adapted to cause the bale support member to move from the bale clearing position to the bale supporting position responsive to the load bed being moved from the bale discharging position to the bale receiving position.

21. An agricultural bale accumulator according to claim 19 wherein the bale support member further comprises:

at least one substantially planar plate.

22. An agricultural bale accumulator according to claim 19 wherein the bale support member further comprises:

at least one elongated bar.

23. An agricultural bale accumulator according to claim 19 wherein the agricultural bale accumulator further comprises:

a hinge mechanism mechanically coupled to the load bed at the entry region of the load bed along the bale receiving axis and having a hinge axis, wherein the hinge mechanism is adapted to mechanically couple the bale support member to the load bed about the hinge axis, wherein the

bale support member is permitted to rotate about the hinge axis between the bale supporting position and the bale clearing position.

24. An agricultural bale accumulator according to claim 19 wherein the agricultural bale accumulator further comprises:

a slide mechanism mechanically coupled to the load bed at the entry region of the load bed along the bale receiving axis and having a slide axis, wherein the hinge mechanism is adapted to mechanically couple the bale support member to the load bed about the slide axis, wherein the bale support member is permitted to slide along the slide axis between the bale supporting position and the bale clearing position.

Vertically Offset Load Bed Module:

1. An agricultural bale accumulator comprising:

a base module including:

a frame supported above a ground surface;

a load bed being substantially planar and being supported by the frame, wherein the load bed is adapted to receive thereon a plurality of bales at a first rate of speed along a bale receiving axis in a bale receiving direction to accumulate thereon the plurality of bales, wherein the load bed has an entry region designating a part of the load bed where the plurality of bales are first received on the load bed, and wherein each of the plurality of bales are supported by a bale delivering surface before they are first received at the entry region of the load bed; and

a bale discharge module adapted to discharge the plurality of bales accumulated on the load bed to the ground surface, the bale discharge module further comprising:

a pivot mechanism mechanically coupled to the frame and the load bed and adapted to pivot the load bed between a bale receiving position and a bale discharging position, wherein the load bed is located in a horizontal position relative to the frame when the load bed is located in the bale receiving position, wherein the load bed is located in an inclined position relative to the frame when the load bed is located in the bale discharging position, and wherein the pivot mechanism pivots the load bed relative to the frame from the bale receiving position to the bale discharging position to discharge the plurality of bales accumulated on the load bed to the ground surface under a gravitational force acting on the plurality of bales;

wherein the bale delivering surface is horizontally separated from the entry region of the load bed along the bale receiving axis by a horizontal space having a predetermined horizontal distance when the load bed is located in the bale receiving position, wherein the bale delivering surface is vertically separated above at least the entry region of the load bed relative to the ground surface by a vertical space having a predetermined vertical distance when the load bed is located in the bale receiving position, wherein the predetermined vertical distance is greater than an amount of sag from each of the plurality of bales due to gravitational force acting on each of the plurality of bales as each of the plurality of bales bridges the predetermined horizontal distance between the bale delivering surface and the entry region of the load bed, wherein the predetermined horizontal

distance along the bale receiving axis permits a bale traveling distance to form between a next bale of the plurality of bales to be received on the load bed and the entry region of the load bed so that the entry region of the load bed does not interfere with the next bale of the plurality of bales to be received on the load bed when the load bed returns from the bale discharging position to the bale receiving position, and wherein the load bed moves from the bale receiving position to the bale discharging position and back to the bale receiving position in a first amount of time less than a second amount of time required for the next bale of the plurality of bales to move through the bale traveling distance at the first rate of speed along the bale receiving path.

- 10 2. An agricultural bale accumulator according to claim 1 further comprising:  
a major bale accumulating surface of the load bed being substantially coplanar with the bale delivering surface; and

15 a recess formed in a side of the load bed at the entry region of the load bed along the bale receiving axis, wherein the recess includes a bale receiving surface having a bale receiving end being disposed at the entry region of the load bed along the bale receiving axis and being disposed the predetermined vertical distance below the bale delivering surface, and wherein the bale receiving surface is upwardly sloped towards the major bale accumulating surface of the load bed relative to the ground surface along the bale receiving axis in the bale receiving direction when the load bed is in the bale receiving position to permit the bale receiving surface to guide any sag in  
20 each of the plurality of bales up bale receiving surface to the major bale accumulating surface of the load bed as each of the plurality of bales are received at the entry region of the load bed along the bale receiving axis in the bale receiving direction when the load bed is in the bale receiving position.

- 25 3. An agricultural bale accumulator according to claim 2 wherein the load bed further comprises:

a notch formed in the side of the load bed at the entry region of the load bed along the bale receiving path, wherein the notch has a predetermined notch distance along the bale receiving path which contributes to at least a portion of the predetermined horizontal distance between the bale  
30 delivering surface and the entry region of the load bed to permit the next bale of the plurality of bales to be received on the load bed at the entry region of the load bed without interfering with the entry region of the load bed when the load bed returns from the bale discharging position to the bale receiving position.

- 35 4. An agricultural bale accumulator according to claim 1 further comprising:

a major bale accumulating surface of the load bed being substantially coplanar with the entry region of the load bed and being disposed the predetermined vertical distance below the bale delivering surface to permit the predetermined vertical distance compensate for any sag in each of the plurality of bales as each of the plurality of bales are received at the entry region of the load

bed along the bale receiving axis in the bale receiving direction when the load bed is in the bale receiving position.

5. An agricultural bale accumulator according to claim 1:

wherein the agricultural bale accumulator is adapted to be pulled in tandem behind an agricultural baler in an accumulator traveling direction across the ground surface,

wherein the plurality of bales, including a first bale followed by a second bale, are successively ejected from a bale chamber of the agricultural baler at the first rate of speed along the bale receiving axis in the bale receiving direction essentially opposite to the accumulator traveling direction,

wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the load bed along the bale receiving axis in the bale traveling direction, and

wherein each of the plurality of bales are received on the load bed along the bale receiving axis to accumulate thereon each of the plurality of bales responsive to each of the plurality of bales being completely formed and ejected from the bale chamber of the agricultural baler.

6. An agricultural bale accumulator according to claim 1 further comprising:

a bale transfer module adapted to distribute each of the plurality of bales received on the load bed across the load bed along a bale distributing axis horizontally traverse to the bale receiving axis to position the plurality of bales received on the load bed in a side-by-side relationship on the load bed to accumulate a predetermined number of the plurality of bales on the load bed; and

a load bed capacity sensor adapted to determine that the load bed has accumulated the predetermined number of the plurality of bales on the load bed,

wherein the bale discharge module discharges the plurality of bales accumulated on the load bed to the ground surface responsive to a determination by the load bed capacity sensor that the load bed has accumulated the predetermined number of the plurality of bales on the load bed.

7. An agricultural bale accumulator adapted to be pulled in tandem behind an agricultural baler in an accumulator traveling direction across a ground surface, the agricultural bale accumulator comprising:

a frame supported above the ground surface;

a load bed being substantially planar and being supported by the frame, wherein the load bed is adapted to receive thereon a plurality of bales, including a first bale followed by a second bale, successively ejected from a bale chamber of the agricultural baler at a first rate of speed along a bale receiving axis in a bale receiving direction essentially opposite to the accumulator traveling direction, wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the load bed along the bale receiving axis in the bale receiving direction, wherein each of the plurality of bales are

received on the load bed along the bale receiving axis responsive to each of the plurality of bales being completely formed and ejected from the bale chamber of the agricultural baler, wherein the load bed has an entry region designating a part of the load bed where the plurality of bales are first received in the bale receiving direction along the bale receiving axis, and wherein each of the plurality of bales are supported by a bale delivering surface before they are first received at the entry region of the load bed;

a bale transfer module adapted to distribute each of the plurality of bales received on the load bed across the load bed along a bale distributing axis horizontally traverse to the bale receiving axis to position the plurality of bales received on the load bed in a side-by-side relationship on the load bed to accumulate a predetermined number of the plurality of bales on the load bed; and

a load bed capacity sensor adapted to determine that the load bed has accumulated the predetermined number of the plurality of bales on the load bed; and

a bale discharge module adapted to discharge the plurality of bales accumulated on the load bed to the ground surface responsive to a determination by the load bed capacity sensor that the load bed has accumulated the predetermined number of the plurality of bales on the load bed, the bale discharge module further comprising:

a pivot mechanism mechanically coupled to the frame and the load bed and adapted to pivot the load bed between a bale receiving position and a bale discharging position, wherein the load bed is located in a horizontal position relative to the frame when the load bed is located in the bale receiving position, wherein the load bed is located in an inclined position relative to the frame when the load bed is located in the bale discharging position, and wherein the pivot mechanism pivots the load bed relative to the frame from the bale receiving position to the bale discharging position to discharge the plurality of bales accumulated on the load bed to the ground surface under a gravitational force acting on the plurality of bales; and

wherein the bale delivering surface is horizontally separated from the entry region of the load bed along the bale receiving axis by a horizontal space having a predetermined horizontal distance when the load bed is located in the bale receiving position, wherein the bale delivering surface is vertically separated above at least the entry region of the load bed relative to the ground surface by a vertical space having a predetermined vertical distance when the load bed is located in the bale receiving position, wherein the predetermined vertical distance is greater than an amount of sag from each of the plurality of bales due to gravitational force acting on each of the plurality of bales as each of the plurality of bales bridges the predetermined horizontal distance between the bale delivering surface and the entry region of the load bed, wherein the predetermined horizontal distance along the bale receiving axis permits a bale traveling distance to form between a next bale of the plurality of bales to be received on the load bed and the entry region of the load bed so that the entry region of the load bed does not interfere with the next bale of the plurality of bales to be received on the load bed when the load bed returns from the bale discharging position to the bale receiving position, and wherein the load bed moves from the bale receiving position to the bale discharging position and back to the bale receiving position in a first amount of time less than a

second amount of time required for the next bale of the plurality of bales to move through the bale traveling distance at the first rate of speed along the bale receiving path.

8. An agricultural bale accumulator according to claim 7 further comprising:

5 a major bale accumulating surface of the load bed being substantially coplanar with the bale delivering surface; and

10 a recess formed in a side of the load bed at the entry region of the load bed along the bale receiving axis, wherein the recess includes a bale receiving surface having a bale receiving end being disposed at the entry region of the load bed along the bale receiving axis and being disposed the predetermined vertical distance below the bale delivering surface, and wherein the bale receiving surface is upwardly sloped towards the major bale accumulating surface of the load bed relative to the ground surface along the bale receiving axis in the bale receiving direction when the load bed is in the bale receiving position to permit the bale receiving surface to guide any sag in each of the plurality of bales up bale receiving surface to the major bale accumulating surface of the load bed as each of the plurality of bales are received at the entry region of the load bed along the bale receiving axis in the bale receiving direction when the load bed is in the bale receiving position.

9. An agricultural bale accumulator according to claim 8 wherein the load bed further comprises:

20 a notch formed in the side of the load bed at the entry region of the load bed along the bale receiving path, wherein the notch has a predetermined notch distance along the bale receiving path which contributes to at least a portion of the predetermined horizontal distance between the bale delivering surface and the entry region of the load bed to permit the next bale of the plurality of bales to be received on the load bed at the entry region of the load bed without interfering with the entry region of the load bed when the load bed returns from the bale discharging position to the bale receiving position.

10. An agricultural bale accumulator according to claim 7 further comprising:

30 a major bale accumulating surface of the load bed being substantially coplanar with the entry region of the load bed and being disposed the predetermined vertical distance below the bale delivering surface to permit the predetermined vertical distance compensate for any sag in each of the plurality of bales as each of the plurality of bales are received at the entry region of the load bed along the bale receiving axis in the bale receiving direction when the load bed is in the bale receiving position.

## Selective Bale Discharge Control Module:

## 1. An agricultural bale accumulator comprising:

a base module comprising:

5 a load bed which is substantially planar, wherein the load bed includes a bale receiving portion and a bale accumulating portion, wherein the bale receiving portion is located on the bale receiving axis and is adapted to receive thereon a plurality of bales along the bale receiving axis, and wherein the bale accumulating portion is located adjacent to the bale receiving portion and is adapted to accumulate thereon the plurality of bales; and

10 a selective bale discharge control module adapted to selectively control a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to a ground surface.

## 2. An agricultural bale accumulator according to claim 1,

15 wherein the base module further comprises:

a bale position sensor adapted to determine whether the plurality of bales have reach a predetermined position on the bale receiving portion along the bale receiving axis responsive to receiving the plurality of bales on the bale receiving portion along the bale receiving axis indicating that the plurality of bales are completely formed, ejected from a bale chamber of an agricultural baler and substantially received on the bale receiving portion, and

20 wherein the selective bale discharge control module selectively controls the discharge of the plurality of bales accumulated on the load bed from the at least one of the bale receiving portion and the bale accumulating portion to the ground surface responsive to a determination of whether the plurality of bales have reach the predetermined position on the bale receiving portion along the bale receiving axis.

## 3. An agricultural bale accumulator according to claim 1,

wherein the base module further comprises:

30 a bale carrying capacity sensor adapted to determine how many bales of the plurality of bales are accumulated on the load bed, and

wherein the selective bale discharge control module selectively controls the discharge of the plurality of bales accumulated on the load bed from the at least one of the bale receiving portion and the bale accumulating portion to the ground surface responsive to a determination of how many bales of the plurality of bales are accumulated on the load bed.

## 4. An agricultural bale accumulator according to claim 1 further comprising:

a field position locator module comprising:

35 a field position locator adapted to determine a position of the agricultural bale accumulator in a field,

wherein the selective bale discharge control module selectively controls the discharge of the plurality of bales accumulated on the load bed from the at least one of the bale receiving portion and the bale accumulating portion to the ground surface responsive to a determination of the position of the agricultural bale accumulator in the field.

5           5.       An agricultural bale accumulator according to claim 1 further comprising:

          a bale discharge module adapted to discharge the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface.

10           6.       An agricultural bale accumulator according to claim 5,  
          wherein the base module further comprises:

          a frame adapted to support the load bed above the ground surface, and  
          wherein the bale discharge module further comprises:

15           a pivot mechanism mechanically coupled to the frame and adapted to pivot the at least one of the bale receiving portion and the bale accumulating portion between a bale receiving position and a bale discharging position, wherein the at least one of the bale receiving portion and the bale accumulating portion is located in a horizontal position relative to the frame when the at least one of the bale receiving portion and the bale accumulating portion is located in the bale receiving position, wherein the at least one of the bale receiving portion and the bale accumulating portion is located in an inclined position relative to the frame when the at least one of the bale receiving portion and the bale accumulating portion is located in the bale discharging position, and wherein the pivot mechanism permits the at least one of the bale receiving portion and the bale accumulating portion to pivot relative to the frame from the bale receiving position to the bale discharging position to permit a gravitational force acting on the plurality of bales to discharge the plurality of bales accumulated on the at least one of the bale receiving portion and the bale accumulating portion to the ground surface.

25           7.       An agricultural bale accumulator according to claim 6 wherein the bale discharge module further comprises:

30           a first discharge mechanism adapted to cause the bale accumulating portion to pivot between the bale receiving position and the bale discharging position; and

          a second discharge mechanism adapted to cause the bale receiving portion to pivot between the bale receiving position and the bale discharging position.

35           8.       An agricultural bale accumulator according to claim 7 wherein the selective bale discharge control module selectively controls the first discharge mechanism and the second discharge mechanism to cause the bale accumulating portion to pivot between the bale receiving position and the bale discharging position independently of the bale receiving portion pivoting between the bale receiving position and the bale discharging position.



9. An agricultural bale accumulator according to claim 8,  
wherein the first discharge mechanism further comprises a first discharge cylinder  
mechanically coupled between the bale accumulating portion and the frame, and

5 wherein the second discharge mechanism further comprises a second discharge cylinder  
mechanically coupled between the bale receiving portion and the frame.

10. An agricultural bale accumulator according to claim 8,

10 wherein the pivot mechanism is mechanically coupled to the frame at a counter balance  
location to permit the at least one of the bale receiving portion and the bale accumulating portion of  
the load bed to pivot from the bale receiving position to the bale discharging position responsive to  
a force of gravity exerted upon the plurality of bales accumulated on the at least one of the bale  
receiving portion and the bale accumulating portion of the load bed and to permit the at least one of  
the bale receiving portion and the bale accumulating portion of the load bed to pivot from the bale  
15 discharging position to the bale receiving position responsive to the force of gravity exerted upon  
the at least one of the bale receiving portion and the bale accumulating portion of the load bed,

wherein the first discharge mechanism further comprises:

20 a first latch adapted to release the bale accumulating portion from the frame when  
the bale accumulating portion is located in the bale receiving position to permit the bale  
accumulating portion to pivot from the bale receiving position to the bale discharging position  
responsive to a force of gravity exerted upon the plurality of bales accumulated on the bale  
accumulating portion and to permit the bale accumulating portion to pivot from the bale  
discharging position to the bale receiving position responsive to the force of gravity exerted upon  
the bale accumulating portion; and

25 wherein the second discharge mechanism further comprises:

30 a second latch adapted to release the bale receiving portion from the frame when  
the bale receiving portion is located in the bale receiving position to permit the bale receiving  
portion to pivot from the bale receiving position to the bale discharging position responsive to a  
force of gravity exerted upon the plurality of bales accumulated on the bale receiving portion and  
to permit the bale receiving portion to pivot from the bale discharging position to the bale receiving  
position responsive to the force of gravity exerted upon the bale receiving portion.

35 11. An agricultural bale accumulator according to claim 7 wherein the selective bale discharge  
control module selectively controls the second discharge mechanism and the first discharge  
mechanism to permit the bale receiving portion to pivot between the bale receiving position and the  
bale discharging position when the bale accumulating portion pivots between the bale receiving  
position and the bale discharging position.

40 12. An agricultural bale accumulator according to claim 11 wherein second discharge  
mechanism is adapted to mechanically couple the bale receiving portion to the bale accumulating

portion to permit the bale receiving portion to pivot between the bale receiving position and the bale discharging position with the bale accumulating portion when the first discharge mechanism pivots the bale accumulating portion between the bale receiving position and the bale discharging position, and is adapted to mechanically decouple the bale receiving portion from the bale accumulating portion to permit the bale accumulating portion to pivot between the bale receiving position and the bale discharging position without the bale receiving portion when the first discharge mechanism pivots the bale accumulating portion between the bale receiving position and the bale discharging position.

10 13. An agricultural bale accumulator according to claim 12 wherein second discharge mechanism further comprises:

a latch mechanism adapted to mechanically couple and decouple the bale receiving portion and the bale accumulating portion.

15 14. An agricultural bale accumulator according to claim 1 further comprising:

a bale transfer module adapted to transfer the plurality of bales across the load bed from the bale receiving portion to the bale accumulating portion along a bale transfer axis horizontally transverse to the bale receiving axis responsive to the plurality of bales being received on the bale receiving portion to accumulate the plurality of bales on the bale accumulating portion.

20

15. An agricultural bale accumulator according to claim 1,  
wherein the base module further comprises:

25 a bale position sensor adapted to determine whether the plurality of bales have reach a predetermined position on the bale receiving portion along the bale receiving axis responsive to receiving the plurality of bales on the bale receiving portion indicating that the plurality of bales are completely formed, ejected from the bale chamber of the agricultural baler and substantially received on the bale receiving portion, wherein the agricultural bale accumulator further comprises:

30 a bale discharge module adapted to discharge the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface,

wherein the selective bale discharge module:

35 is adapted to control the discharge of the plurality of bales accumulated on the bale accumulating portion from the bale accumulating portion to the ground surface responsive a determination that the plurality of bales have not reached the predetermined position on the bale receiving portion along the bale receiving axis, and

is adapted to control the discharge of the plurality of bales accumulated on the bale receiving portion and the bale accumulating portion from the bale receiving portion and the bale accumulating portion to the ground surface responsive a determination that the plurality of bales

have reached the predetermined position on the bale receiving portion along the bale receiving axis.

16. An agricultural bale accumulator according to claim 15 wherein the selective bale discharge module is adapted to control the discharge of the bale of the plurality of bales received on the bale receiving portion from the bale receiving portion to the ground surface responsive to a determination that the plurality of bales have reached the predetermined position on the bale receiving portion along the bale receiving axis.

17. An agricultural bale accumulator according to claim 1:  
wherein the agricultural bale accumulator is adapted to be pulled in tandem behind an agricultural baler in an accumulator traveling direction across the ground surface,

wherein the plurality of bales, including a first bale followed by a second bale, are successively ejected from a bale chamber of the agricultural baler at along the bale receiving axis in a bale traveling direction essentially opposite to the accumulator traveling direction, and

wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the load bed along the bale receiving axis in the bale traveling direction.

18. An agricultural bale accumulator comprising:  
a base module comprising:

a frame; and

a load bed which is substantially planar and adapted to be supported by the frame above a ground surface, wherein the load bed includes a bale receiving portion and a bale accumulating portion, wherein the bale receiving portion is located on the bale receiving axis and is adapted to receive thereon a plurality of bales along the bale receiving axis, and wherein the bale accumulating portion is located adjacent to the bale receiving portion and is adapted to accumulate thereon the plurality of bales;

a bale position sensor adapted to determine whether the plurality of bales have reach a predetermined position on the bale receiving portion along the bale receiving axis responsive to receiving the plurality of bales on the bale receiving portion along the bale receiving axis indicating that the plurality of bales are completely formed, ejected from a bale chamber of an agricultural baler and substantially received on the bale receiving portion;

a bale transfer module adapted to transfer the plurality of bales across the load bed from the bale receiving portion to the bale accumulating portion along a bale transfer axis horizontally transverse to the bale receiving axis responsive to a determination of that the plurality of bales have reached the predetermined position on the bale receiving portion along the bale receiving axis to accumulate the plurality of bales on the bale accumulating portion;

a bale discharge module adapted to discharge the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface, wherein the bale discharge module further comprises:

5 a pivot mechanism mechanically coupled to the frame and adapted to pivot the at least one of the bale receiving portion and the bale accumulating portion between a bale receiving position and a bale discharging position, wherein the at least one of the bale receiving portion and the bale accumulating portion is located in a horizontal position relative to the frame when the at least one of the bale receiving portion and the bale accumulating portion is located in the bale receiving position, wherein the at least one of the bale receiving portion and the bale accumulating  
10 portion is located in an inclined position relative to the frame when the at least one of the bale receiving portion and the bale accumulating portion is located in the bale discharging position, and wherein the pivot mechanism permits the at least one of the bale receiving portion and the bale accumulating portion to pivot relative to the frame from the bale receiving position to the bale discharging position to permit a gravitational force acting on the plurality of bales to discharge the  
15 plurality of bales accumulated on the at least one of the bale receiving portion and the bale accumulating portion to the ground surface; and

a selective bale discharge control module adapted to selectively control a discharge of the plurality of bales on the load bed from the at least one of the bale receiving portion and the bale accumulating portion to the ground surface responsive to a determination of whether the plurality  
20 of bales have reached the predetermined position on the bale receiving portion along the bale receiving axis.

19. An agricultural bale accumulator according to claim 18,  
wherein the base module further comprises:

25 a bale carrying capacity sensor adapted to determine how many bales of the plurality of bales are accumulated on the load bed, and

wherein the selective bale discharge control module further selectively controls the discharge of the plurality of bales accumulated on the load bed from the at least one of the bale receiving portion and the bale accumulating portion to the ground surface responsive to a  
30 determination of how many bales of the plurality of bales are accumulated on the load bed.

20. An agricultural bale accumulator according to claim 18 further comprising:  
a field position locator module comprising:

35 a field position locator adapted to determine a position of the agricultural bale accumulator in a field,

wherein the selective bale discharge control module further selectively controls the discharge of the plurality of bales accumulated on the load bed from the at least one of the bale receiving portion and the bale accumulating portion to the ground surface responsive to a determination of the position of the agricultural bale accumulator in the field.

21. An agricultural bale accumulator according to claim 18 wherein the bale discharge module further comprises:

5 a first discharge mechanism adapted to cause the bale accumulating portion to pivot between the bale receiving position and the bale discharging position; and

a second discharge mechanism adapted to cause the bale receiving portion to pivot between the bale receiving position and the bale discharging position.

22. An agricultural bale accumulator according to claim 21 wherein the selective bale discharge control module selectively controls the first discharge mechanism and the second discharge mechanism to cause the bale accumulating portion to pivot between the bale receiving position and the bale discharging position independently of the bale receiving portion pivoting between the bale receiving position and the bale discharging position.

23. An agricultural bale accumulator according to claim 22, wherein the first discharge mechanism further comprises a first discharge cylinder mechanically coupled between the bale accumulating portion and the frame, and

wherein the second discharge mechanism further comprises a second discharge cylinder mechanically coupled between the bale receiving portion and the frame.

24. An agricultural bale accumulator according to claim 22, wherein the pivot mechanism is mechanically coupled to the frame at a counter balance location to permit the at least one of the bale receiving portion and the bale accumulating portion of the load bed to pivot from the bale receiving position to the bale discharging position responsive to a force of gravity exerted upon the plurality of bales accumulated on the at least one of the bale receiving portion and the bale accumulating portion of the load bed and to permit the at least one of the bale receiving portion and the bale accumulating portion of the load bed to pivot from the bale discharging position to the bale receiving position responsive to the force of gravity exerted upon the at least one of the bale receiving portion and the bale accumulating portion of the load bed,

wherein the first discharge mechanism further comprises:

a first latch adapted to release the bale accumulating portion from the frame when the bale accumulating portion is located in the bale receiving position to permit the bale accumulating portion to pivot from the bale receiving position to the bale discharging position responsive to a force of gravity exerted upon the plurality of bales accumulated on the bale accumulating portion and to permit the bale accumulating portion to pivot from the bale discharging position to the bale receiving position responsive to the force of gravity exerted upon the bale accumulating portion; and

wherein the second discharge mechanism further comprises:

a second latch adapted to release the bale receiving portion from the frame when the bale receiving portion is located in the bale receiving position to permit the bale receiving

portion to pivot from the bale receiving position to the bale discharging position responsive to a force of gravity exerted upon the plurality of bales accumulated on the bale receiving portion and to permit the bale receiving portion to pivot from the bale discharging position to the bale receiving position responsive to the force of gravity exerted upon the bale receiving portion.

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25. An agricultural bale accumulator according to claim 21 wherein the selective bale discharge control module selectively controls the second discharge mechanism and the first discharge mechanism to permit the bale receiving portion to pivot between the bale receiving position and the bale discharging position when the bale accumulating portion pivots between the bale receiving  
10 position and the bale discharging position.

26. An agricultural bale accumulator according to claim 25 wherein second discharge mechanism is adapted to mechanically couple the bale receiving portion to the bale accumulating portion to permit the bale receiving portion to pivot between the bale receiving position and the  
15 bale discharging position with the bale accumulating portion when the first discharge mechanism pivots the bale accumulating portion between the bale receiving position and the bale discharging position, and is adapted to mechanically decouple the bale receiving portion from the bale accumulating portion to permit the bale accumulating portion to pivot between the bale receiving position and the bale discharging position without the bale receiving portion when the first  
20 discharge mechanism pivots the bale accumulating portion between the bale receiving position and the bale discharging position.

27. An agricultural bale accumulator according to claim 26 wherein second discharge mechanism further comprises:  
25 a latch mechanism adapted to mechanically couple and decouple the bale receiving portion and the bale accumulating portion.

28. An agricultural bale accumulator according to claim 18,  
wherein the selective bale discharge module:  
30 is adapted to control the discharge of the plurality of bales accumulated on the bale accumulating portion from the bale accumulating portion to the ground surface responsive a determination that the plurality of bales have not reached the predetermined position on the bale receiving portion along the bale receiving axis, and  
is adapted to control the discharge of the plurality of bales accumulated on the bale  
35 receiving portion and the bale accumulating portion from the bale receiving portion and the bale accumulating portion to the ground surface responsive a determination that the plurality of bales have reached the predetermined position on the bale receiving portion along the bale receiving axis.

29. An agricultural bale accumulator according to claim 28 wherein the selective bale discharge module is adapted to control the discharge of the bale of the plurality of bales received on the bale receiving portion from the bale receiving portion to the ground surface responsive to a determination that the plurality of bales have reached the predetermined position on the bale receiving portion along the bale receiving axis.

30. An agricultural bale accumulator according to claim 18:

wherein the agricultural bale accumulator is adapted to be pulled in tandem behind an agricultural baler in an accumulator traveling direction across the ground surface,

wherein the plurality of bales, including a first bale followed by a second bale, are successively ejected from a bale chamber of the agricultural baler at along the bale receiving axis in a bale traveling direction essentially opposite to the accumulator traveling direction, and

wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the load bed along the bale receiving axis in the bale traveling direction.

31. An agricultural bale accumulator adapted to be pulled in tandem behind an agricultural baler in an accumulator traveling direction across a ground surface, the agricultural bale accumulator comprising:

a base module comprising:

a frame; and

a load bed which is substantially planar and adapted to be supported by the frame above the ground surface, wherein the load bed includes a bale receiving portion and a bale accumulating portion, wherein the bale receiving portion is located on the bale receiving axis and is adapted to receive thereon a plurality of bales along the bale receiving axis, wherein the bale accumulating portion is located adjacent to the bale receiving portion and is adapted to accumulate thereon the plurality of bales, wherein the plurality of bales, including a first bale followed by a second bale, are successively ejected from a bale chamber of the agricultural baler along the bale receiving axis in a bale traveling direction essentially opposite to the accumulator traveling direction, and wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the bale receiving portion along the bale receiving axis in the bale traveling direction;

a bale position sensor adapted to determine whether the plurality of bales have reach a predetermined position on the bale receiving portion along the bale receiving axis responsive to receiving the plurality of bales on the bale receiving portion along the bale receiving axis indicating that the plurality of bales are completely formed, ejected from a bale chamber of an agricultural baler and substantially received on the bale receiving portion;

a bale transfer module adapted to transfer the plurality of bales across the load bed from the bale receiving portion to the bale accumulating portion along a bale transfer axis horizontally transverse to the bale receiving axis a determination of that the plurality of bales have reached the

predetermined position on the bale receiving portion along the bale receiving axis to accumulate the plurality of bales on the bale accumulating portion;

a bale discharge module adapted to discharge the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface, wherein the bale discharge module further comprises:

a pivot mechanism mechanically coupled to the frame and adapted to pivot the at least one of the bale receiving portion and the bale accumulating portion between a bale receiving position and a bale discharging position, wherein the at least one of the bale receiving portion and the bale accumulating portion is located in a horizontal position relative to the frame when the at least one of the bale receiving portion and the bale accumulating portion is located in the bale receiving position, wherein the at least one of the bale receiving portion and the bale accumulating portion is located in an inclined position relative to the frame when the at least one of the bale receiving portion and the bale accumulating portion is located in the bale discharging position, and wherein the pivot mechanism permits the at least one of the bale receiving portion and the bale accumulating portion to pivot relative to the frame from the bale receiving position to the bale discharging position to permit a gravitational force acting on the plurality of bales to discharge the plurality of bales accumulated on the at least one of the bale receiving portion and the bale accumulating portion to the ground surface;

a first discharge mechanism adapted to cause the bale accumulating portion to pivot between the bale receiving position and the bale discharging position; and

a second discharge mechanism adapted to cause the bale receiving portion to pivot between the bale receiving position and the bale discharging position; and

a selective bale discharge control module adapted to selectively control a discharge of the plurality of bales accumulated on the load bed from the at least one of the bale receiving portion and the bale accumulating portion to the ground surface responsive to a determination of whether the plurality of bales have reached the predetermined position on the bale receiving portion along the bale receiving axis.

32. An agricultural bale accumulator according to claim 31,  
wherein the base module further comprises:

a bale carrying capacity sensor adapted to determine how many bales of the plurality of bales are accumulated on the load bed, and

wherein the selective bale discharge control module further selectively controls the discharge of the plurality of bales accumulated on the load bed from the at least one of the bale receiving portion and the bale accumulating portion to the ground surface responsive to a determination of how many bales of the plurality of bales are accumulated on the load bed.

33. An agricultural bale accumulator according to claim 31 further comprising:  
a field position locator module comprising:



a field position locator adapted to determine a position of the agricultural bale accumulator in a field,

wherein the selective bale discharge control module further selectively controls the discharge of the plurality of bales accumulated on the load bed from the at least one of the bale receiving portion and the bale accumulating portion to the ground surface responsive to a determination of the position of the agricultural bale accumulator in the field.

34. An agricultural bale accumulator according to claim 31 wherein the selective bale discharge control module selectively controls the first discharge mechanism and the second discharge mechanism to cause the bale accumulating portion to pivot between the bale receiving position and the bale discharging position independently of the bale receiving portion pivoting between the bale receiving position and the bale discharging position.

35. An agricultural bale accumulator according to claim 34,

wherein the first discharge mechanism further comprises a first discharge cylinder mechanically coupled between the bale accumulating portion and the frame, and

wherein the second discharge mechanism further comprises a second discharge cylinder mechanically coupled between the bale receiving portion and the frame.

36. An agricultural bale accumulator according to claim 34,

wherein the pivot mechanism is mechanically coupled to the frame at a counter balance location to permit the at least one of the bale receiving portion and the bale accumulating portion of the load bed to pivot from the bale receiving position to the bale discharging position responsive to a force of gravity exerted upon the plurality of bales accumulated on the at least one of the bale receiving portion and the bale accumulating portion of the load bed and to permit the at least one of the bale receiving portion and the bale accumulating portion of the load bed to pivot from the bale discharging position to the bale receiving position responsive to the force of gravity exerted upon the at least one of the bale receiving portion and the bale accumulating portion of the load bed,

wherein the first discharge mechanism further comprises:

a first latch adapted to release the bale accumulating portion from the frame when the bale accumulating portion is located in the bale receiving position to permit the bale accumulating portion to pivot from the bale receiving position to the bale discharging position responsive to a force of gravity exerted upon the plurality of bales accumulated on the bale accumulating portion and to permit the bale accumulating portion to pivot from the bale discharging position to the bale receiving position responsive to the force of gravity exerted upon the bale accumulating portion; and

wherein the second discharge mechanism further comprises:

a second latch adapted to release the bale receiving portion from the frame when the bale receiving portion is located in the bale receiving position to permit the bale receiving portion to pivot from the bale receiving position to the bale discharging position responsive to a

force of gravity exerted upon the plurality of bales accumulated on the bale receiving portion and to permit the bale receiving portion to pivot from the bale discharging position to the bale receiving position responsive to the force of gravity exerted upon the bale receiving portion.

- 5 37. An agricultural bale accumulator according to claim 31 wherein the selective bale discharge control module selectively controls the second discharge mechanism and the first discharge mechanism to permit the bale receiving portion to pivot between the bale receiving position and the bale discharging position when the bale accumulating portion pivots between the bale receiving position and the bale discharging position.

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38. An agricultural bale accumulator according to claim 37 wherein second discharge mechanism is adapted to mechanically couple the bale receiving portion to the bale accumulating portion to permit the bale receiving portion to pivot between the bale receiving position and the bale discharging position with the bale accumulating portion when the first discharge mechanism  
15 pivots the bale accumulating portion between the bale receiving position and the bale discharging position, and is adapted to mechanically decouple the bale receiving portion from the bale accumulating portion to permit the bale accumulating portion to pivot between the bale receiving position and the bale discharging position without the bale receiving portion when the first discharge mechanism pivots the bale accumulating portion between the bale receiving position and  
20 the bale discharging position.

39. An agricultural bale accumulator according to claim 38 wherein second discharge mechanism further comprises:  
a latch mechanism adapted to mechanically couple and decouple the bale receiving portion  
25 and the bale accumulating portion.

40. An agricultural bale accumulator according to claim 31,  
wherein the selective bale discharge module:  
is adapted to control the discharge of the plurality of bales accumulated on the bale  
30 accumulating portion from the bale accumulating portion to the ground surface responsive a determination that the plurality of bales have not reached the predetermined position on the bale receiving portion along the bale receiving axis, and  
is adapted to control the discharge of the plurality of bales accumulated on the bale receiving portion and the bale accumulating portion from the bale receiving portion and the bale  
35 accumulating portion to the ground surface responsive a determination that the plurality of bales have reached the predetermined position on the bale receiving portion along the bale receiving axis.

41. An agricultural bale accumulator according to claim 40 wherein the selective bale discharge  
40 module is adapted to control the discharge of the bale of the plurality of bales received on the bale

receiving portion from the bale receiving portion to the ground surface responsive to a determination that the plurality of bales have reached the predetermined position on the bale receiving portion along the bale receiving axis.

5 42. A method for operating an agricultural bale accumulator comprising the steps of:  
receiving a plurality of bales on a bale receiving portion of a load bed which is  
substantially planar along a bale receiving axis;  
accumulating the plurality of bales on a bale accumulating portion of the load bed which is  
located adjacent to the bale receiving portion responsive to the step of receiving; and  
10 selectively controlling a discharge of the plurality of bales accumulated on the load bed  
from at least one of the bale receiving portion and the bale accumulating portion to a ground  
surface.

15 43. A method according to claim 42 further comprising the step of:  
determining whether the plurality of bales have reach a predetermined position on the bale  
receiving portion along the bale receiving axis responsive to receiving the plurality of bales on the  
bale receiving portion along the bale receiving axis indicating that the plurality of bales are  
completely formed, ejected from a bale chamber of an agricultural baler and substantially received  
on the bale receiving portion,  
20 wherein the step of selectively controlling a discharge of the plurality of bales accumulated  
on the load bed from at least one of the bale receiving portion and the bale accumulating portion to  
the ground surface is responsive to a determination of whether the plurality of bales have reach the  
predetermined position on the bale receiving portion along the bale receiving axis.

25 43. A method according to claim 42 further comprising the step of:  
determining how many bales of the plurality of bales are accumulated on the load bed,  
wherein the step of selectively controlling a discharge of the plurality of bales accumulated  
on the load bed from at least one of the bale receiving portion and the bale accumulating portion to  
the ground surface is responsive to a determination of how many bales of the plurality of bales are  
30 accumulated on the load bed.

44. A method according to claim 42 further comprising the step of:  
determining a position of the agricultural bale accumulator in a field,  
wherein the step of selectively controlling a discharge of the plurality of bales accumulated  
35 on the load bed from at least one of the bale receiving portion and the bale accumulating portion to  
the ground surface is responsive to a determination of the position of the agricultural bale  
accumulator in the field.

46. A method according to claim 42 further comprising the step of:

discharging the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface.

47. A method according to claim 46 wherein the step of discharging further comprises the step of:

pivoting the at least one of the bale receiving portion and the bale accumulating portion relative to a frame between a bale receiving position and a bale discharging position, wherein the at least one of the bale receiving portion and the bale accumulating portion is located in a horizontal position relative to the frame when the at least one of the bale receiving portion and the bale accumulating portion is located in the bale receiving position, wherein the at least one of the bale receiving portion and the bale accumulating portion is located in an inclined position relative to the frame when the at least one of the bale receiving portion and the bale accumulating portion is located in the bale discharging position, and wherein the step of pivoting causes the at least one of the bale receiving portion and the bale accumulating portion to pivot relative to the frame from the bale receiving position to the bale discharging position to permit a gravitational force acting on the plurality of bales to discharge the plurality of bales accumulated on the at least one of the bale receiving portion and the bale accumulating portion to the ground surface.

48. A method according to claim 47 wherein the step of selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface further comprises the step of:

selectively controlling the bale accumulating portion to pivot between the bale receiving position and the bale discharging position independently of the bale receiving portion pivoting between the bale receiving position and the bale discharging position.

49. A method according to claim 48 wherein the step of selectively controlling the bale accumulating portion to pivot between the bale receiving position and the bale discharging position independently of the bale receiving portion pivoting between the bale receiving position and the bale discharging position further comprises the step of:

selectively controlling a first discharge mechanism mechanically coupled between the bale accumulating portion and the frame, and

selectively controlling a second discharge mechanism mechanically coupled between the bale receiving portion and the frame.

50. A method according to claim 48 wherein the step of selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface further comprises the step of:

selectively controlling the bale receiving portion to pivot between the bale receiving position and the bale discharging position when the bale accumulating portion pivots between the bale receiving position and the bale discharging position.

51. A method according to claim 50 wherein the step of selectively controlling the bale receiving portion to pivot between the bale receiving position and the bale discharging position when the bale accumulating portion pivots between the bale receiving position and the bale discharging position further comprises the step of:

mechanically coupling the bale receiving portion to the bale accumulating portion to permit the bale receiving portion to pivot between the bale receiving position and the bale discharging position with the bale accumulating portion when the bale accumulating portion pivots between the bale receiving position and the bale discharging position; and

mechanically decoupling the bale receiving portion from the bale accumulating portion to permit the bale accumulating portion to pivot between the bale receiving position and the bale discharging position without the bale receiving portion when the bale accumulating portion pivots between the bale receiving position and the bale discharging position.

52. A method according to claim 42 wherein the step of accumulating the plurality of bales on the bale accumulating portion of the load bed further comprising the step of:

transferring the plurality of bales across the load bed from the bale receiving portion to the bale accumulating portion along a bale transfer axis horizontally transverse to the bale receiving axis responsive to the plurality of bales being received on the bale receiving portion to accumulate the plurality of bales on the bale accumulating portion.

53. A method according to claim 42 further comprising the steps of:

determining whether the plurality of bales have reach a predetermined position on the bale receiving portion along the bale receiving axis responsive to receiving the plurality of bales on the bale receiving portion indicating that the plurality of bales are completely formed, ejected from the bale chamber of the agricultural baler and substantially received on the bale receiving portion; and

discharging the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface,

wherein the step of selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface further comprises the steps of:

controlling the discharge of the plurality of bales accumulated on the bale accumulating portion from the bale accumulating portion to the ground surface responsive a determination that the plurality of bales have not reached the predetermined position on the bale receiving portion along the bale receiving axis; and

controlling the discharge of the plurality of bales accumulated on the bale receiving portion and the bale accumulating portion from the bale receiving portion and the bale accumulating portion to the ground surface responsive a determination that the plurality of bales have reached the predetermined position on the bale receiving portion along the bale receiving axis.

54. A method according to claim 53 wherein the step of selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface further comprises the steps of:

5 controlling the discharge of the bale of the plurality of bales received on the bale receiving portion from the bale receiving portion to the ground surface responsive to a determination that the plurality of bales have reached the predetermined position on the bale receiving portion along the bale receiving axis.

10 55. A method according to claim 42 further comprising the step of:

pulling the agricultural bale accumulator in tandem behind an agricultural baler in an accumulator traveling direction across the ground surface,

wherein the plurality of bales, including a first bale followed by a second bale, are successively ejected from a bale chamber of the agricultural baler at along the bale receiving axis in  
15 a bale traveling direction essentially opposite to the accumulator traveling direction, and

wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the load bed along the bale receiving axis in the bale traveling direction.

20 56. A method for operating an agricultural bale accumulator comprising the steps of:

receiving a plurality of bales on a bale receiving portion of a load bed along a bale receiving axis, wherein the load bed is substantially planar and adapted to be supported by a frame above a ground surface;

determining whether the plurality of bales have reach a predetermined position on the bale  
25 receiving portion along the bale receiving axis responsive to receiving the plurality of bales on the bale receiving portion along the bale receiving axis indicating that the plurality of bales are completely formed, ejected from a bale chamber of an agricultural baler and substantially received on the bale receiving portion;

transferring the plurality of bales across the load bed from the bale receiving portion to a  
30 bale accumulating portion of the load bed which is located adjacent to the bale receiving portion along a bale transfer axis horizontally transverse to the bale receiving axis responsive to a determination of that the plurality of bales have reached the predetermined position on the bale receiving portion along the bale receiving axis to accumulate the plurality of bales on the bale accumulating portion;

35 discharging the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface, wherein the step of discharging further comprises the step of:

pivoting the at least one of the bale receiving portion and the bale accumulating portion relative to a frame between a bale receiving position and a bale discharging position,  
40 wherein the at least one of the bale receiving portion and the bale accumulating portion is located

in a horizontal position relative to the frame when the at least one of the bale receiving portion and the bale accumulating portion is located in the bale receiving position, wherein the at least one of the bale receiving portion and the bale accumulating portion is located in an inclined position relative to the frame when the at least one of the bale receiving portion and the bale accumulating portion is located in the bale discharging position, and wherein the step of pivoting causes the at least one of the bale receiving portion and the bale accumulating portion to pivot relative to the frame from the bale receiving position to the bale discharging position to permit a gravitational force acting on the plurality of bales to discharge the plurality of bales accumulated on the at least one of the bale receiving portion and the bale accumulating portion to the ground surface; and

selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface responsive to a determination of whether the plurality of bales have reach the predetermined position on the bale receiving portion along the bale receiving axis.

57. A method according to claim 56 further comprising the step of:  
determining how many bales of the plurality of bales are accumulated on the load bed,  
wherein the step of selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface is further responsive to a determination of how many bales of the plurality of bales are accumulated on the load bed.

58. A method according to claim 56 further comprising the step of:  
determining a position of the agricultural bale accumulator in a field,  
wherein the step of selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface is further responsive to a determination of the position of the agricultural bale accumulator in the field.

59. A method according to claim 56 wherein the step of selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface further comprises the step of:

selectively controlling the bale accumulating portion to pivot between the bale receiving position and the bale discharging position independently of the bale receiving portion pivoting between the bale receiving position and the bale discharging position.

60. A method according to claim 59 wherein the step of selectively controlling the bale accumulating portion to pivot between the bale receiving position and the bale discharging position independently of the bale receiving portion pivoting between the bale receiving position and the bale discharging position further comprises the step of:

selectively controlling a first discharge mechanism mechanically coupled between the bale accumulating portion and the frame, and

selectively controlling a second discharge mechanism mechanically coupled between the bale receiving portion and the frame.

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61. A method according to claim 56 wherein the step of selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface further comprises the step of:

10 selectively controlling the bale receiving portion to pivot between the bale receiving position and the bale discharging position when the bale accumulating portion pivots between the bale receiving position and the bale discharging position.

62. A method according to claim 61 wherein the step of selectively controlling the bale receiving portion to pivot between the bale receiving position and the bale discharging position  
15 when the bale accumulating portion pivots between the bale receiving position and the bale discharging position further comprises the step of:

20 mechanically coupling the bale receiving portion to the bale accumulating portion to permit the bale receiving portion to pivot between the bale receiving position and the bale discharging position with the bale accumulating portion when the bale accumulating portion pivots between the bale receiving position and the bale discharging position; and

mechanically decoupling the bale receiving portion from the bale accumulating portion to permit the bale accumulating portion to pivot between the bale receiving position and the bale discharging position without the bale receiving portion when the bale accumulating portion pivots between the bale receiving position and the bale discharging position.

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63. A method according to claim 56 further comprising the steps of:

wherein the step of selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface further comprises the steps of:

30 selectively controlling the discharge of the plurality of bales accumulated on the bale accumulating portion from the bale accumulating portion to the ground surface responsive a determination that the plurality of bales have not reached the predetermined position on the bale receiving portion along the bale receiving axis; and

35 selectively controlling the discharge of the plurality of bales accumulated on the bale receiving portion and the bale accumulating portion from the bale receiving portion and the bale accumulating portion to the ground surface responsive a determination that the plurality of bales have reached the predetermined position on the bale receiving portion along the bale receiving axis.



64. A method according to claim 63 wherein the step of selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface further comprises the steps of:

selectively controlling the discharge of the bale of the plurality of bales received on the bale receiving portion from the bale receiving portion to the ground surface responsive to a determination that the plurality of bales have reached the predetermined position on the bale receiving portion along the bale receiving axis.

65. A method according to claim 56 further comprising the step of:

pulling the agricultural bale accumulator in tandem behind an agricultural baler in an accumulator traveling direction across the ground surface,

wherein the plurality of bales, including a first bale followed by a second bale, are successively ejected from a bale chamber of the agricultural baler at along the bale receiving axis in a bale traveling direction essentially opposite to the accumulator traveling direction, and

wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the load bed along the bale receiving axis in the bale traveling direction.

66. A method for operating an agricultural bale accumulator comprising the steps of:

pulling the agricultural bale accumulator in tandem behind an agricultural baler in an accumulator traveling direction across a ground surface, wherein a bale chamber of the agricultural baler successively ejects a plurality of bales, including a first bale followed by a second bale, along a bale receiving axis in a bale traveling direction essentially opposite to the accumulator traveling direction, and wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the agricultural bale accumulator along the bale receiving axis in the bale traveling direction;

receiving the plurality of bales on a bale receiving portion of a load bed along the bale receiving axis, wherein the load bed is substantially planar and adapted to be supported by a frame above the ground surface;

determining whether the plurality of bales have reach a predetermined position on the bale receiving portion along the bale receiving axis responsive to receiving the plurality of bales on the bale receiving portion along the bale receiving axis indicating that the plurality of bales are completely formed, ejected from the bale chamber of the agricultural baler and substantially received on the bale receiving portion;

transferring the plurality of bales across the load bed from the bale receiving portion to a bale accumulating portion of the load bed which is located adjacent to the bale receiving portion along a bale transfer axis horizontally transverse to the bale receiving axis responsive to a determination of that the plurality of bales have reached the predetermined position on the bale receiving portion along the bale receiving axis to accumulate the plurality of bales on the bale accumulating portion;

discharging the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface, wherein the step of discharging further comprises the steps of:

pivoting the at least one of the bale receiving portion and the bale accumulating portion relative to a frame between a bale receiving position and a bale discharging position, wherein the at least one of the bale receiving portion and the bale accumulating portion is located in a horizontal position relative to the frame when the at least one of the bale receiving portion and the bale accumulating portion is located in the bale receiving position, wherein the at least one of the bale receiving portion and the bale accumulating portion is located in an inclined position relative to the frame when the at least one of the bale receiving portion and the bale accumulating portion is located in the bale discharging position, and wherein the step of pivoting causes the at least one of the bale receiving portion and the bale accumulating portion to pivot relative to the frame from the bale receiving position to the bale discharging position to permit a gravitational force acting on the plurality of bales to discharge the plurality of bales accumulated on the at least one of the bale receiving portion and the bale accumulating portion to the ground surface; and

selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface responsive to a determination of whether the plurality of bales have reach the predetermined position on the bale receiving portion along the bale receiving axis.

67. A method according to claim 66 further comprising the step of:

determining how many bales of the plurality of bales are accumulated on the load bed, wherein the step of selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface is further responsive to a determination of how many bales of the plurality of bales are accumulated on the load bed.

68. A method according to claim 66 further comprising the step of:

determining a position of the agricultural bale accumulator in a field, wherein the step of selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface is further responsive to a determination of the position of the agricultural bale accumulator in the field.

69. A method according to claim 66 wherein the step of selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface further comprises the step of:

selectively controlling the bale accumulating portion to pivot between the bale receiving position and the bale discharging position independently of the bale receiving portion pivoting between the bale receiving position and the bale discharging position.

70. A method according to claim 69 wherein the step of selectively controlling the bale accumulating portion to pivot between the bale receiving position and the bale discharging position independently of the bale receiving portion pivoting between the bale receiving position and the bale discharging position further comprises the step of:

selectively controlling a first discharge mechanism mechanically coupled between the bale accumulating portion and the frame, and

selectively controlling a second discharge mechanism mechanically coupled between the bale receiving portion and the frame.

71. A method according to claim 66 wherein the step of selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface further comprises the step of:

selectively controlling the bale receiving portion to pivot between the bale receiving position and the bale discharging position when the bale accumulating portion pivots between the bale receiving position and the bale discharging position.

72. A method according to claim 61 wherein the step of selectively controlling the bale receiving portion to pivot between the bale receiving position and the bale discharging position when the bale accumulating portion pivots between the bale receiving position and the bale discharging position further comprises the step of:

mechanically coupling the bale receiving portion to the bale accumulating portion to permit the bale receiving portion to pivot between the bale receiving position and the bale discharging position with the bale accumulating portion when the bale accumulating portion pivots between the bale receiving position and the bale discharging position; and

mechanically decoupling the bale receiving portion from the bale accumulating portion to permit the bale accumulating portion to pivot between the bale receiving position and the bale discharging position without the bale receiving portion when the bale accumulating portion pivots between the bale receiving position and the bale discharging position.

73. A method according to claim 66 further comprising the steps of:

wherein the step of selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface further comprises the steps of:

controlling the discharge of the plurality of bales accumulated on the bale accumulating portion from the bale accumulating portion to the ground surface responsive a determination that the plurality of bales have not reached the predetermined position on the bale receiving portion along the bale receiving axis; and

controlling the discharge of the plurality of bales accumulated on the bale receiving portion and the bale accumulating portion from the bale receiving portion and the bale

accumulating portion to the ground surface responsive a determination that the plurality of bales have reached the predetermined position on the bale receiving portion along the bale receiving axis.

- 5 74. A method according to claim 73 wherein the step of selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface further comprises the steps of:

controlling the discharge of the bale of the plurality of bales received on the bale receiving portion from the bale receiving portion to the ground surface responsive to a determination that the  
10 plurality of bales have reached the predetermined position on the bale receiving portion along the bale receiving axis.

75. A method for operating an agricultural bale accumulator having a base module including a frame and a load bed, wherein the load bed is substantially planar and adapted to be supported by  
15 the frame above a ground surface, wherein the load bed includes a bale receiving portion and a bale accumulating portion, wherein the bale receiving portion is located on the bale receiving axis and is adapted to receive thereon a plurality of bales along the bale receiving axis, wherein the bale accumulating portion is located adjacent to the bale receiving portion and is adapted to accumulate thereon the plurality of bales, the method comprising the steps of:

20 receiving the plurality of bales on the bale receiving portion of the load bed along the bale receiving axis; and

determining whether the agricultural bale accumulator is ready to discharge the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface;

- 25 when it is determined that the agricultural bale accumulator is not ready to discharge the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface, then perform the step of:

determining whether the plurality of bales have reach a predetermined position on the bale receiving portion along the bale receiving axis responsive to receiving the  
30 plurality of bales on the bale receiving portion along the bale receiving axis indicating that the plurality of bales are completely formed, ejected from a bale chamber of an agricultural baler and substantially received on the bale receiving portion;

- when it is determined that the plurality of bales have reached the predetermined position on the bale receiving portion along the bale receiving axis, then perform  
35 the step of:

transferring the plurality of bales across the load bed from the bale receiving portion to a bale accumulating portion of the load bed which is located adjacent to the bale receiving portion along a bale transfer axis horizontally transverse to the bale receiving axis to accumulate the plurality of bales on the bale accumulating portion; and

when it is determined that the plurality of bales have not reached the predetermined position on the bale receiving portion along the bale receiving axis, then continue to perform the step of:

receiving the plurality of bales on the bale receiving portion  
5 of the load bed along the bale receiving axis; and

when it is determined that the agricultural bale accumulator is ready to discharge the plurality of bales accumulated on the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface, then perform the step of:

selectively controlling a discharge of the plurality of bales accumulated on  
10 the load bed from at least one of the bale receiving portion and the bale accumulating portion to the ground surface.

76. A method according to claim 75 wherein the step of selectively controlling a discharge of the plurality of bales accumulated on the load bed from at least one of the bale receiving portion  
15 and the bale accumulating portion to the ground surface further comprises the step of:

determining whether the plurality of bales have reach a predetermined position on the bale receiving portion along the bale receiving axis responsive to receiving the plurality of bales on the bale receiving portion along the bale receiving axis indicating that the plurality of bales are completely formed, ejected from a bale chamber of an agricultural baler and substantially received  
20 on the bale receiving portion;

when it is determined that the plurality of bales have reached the predetermined position on the bale receiving portion along the bale receiving axis, then perform the step of:

determining whether the agricultural bale accumulator is ready to discharge the plurality of bales accumulated on both the bale receiving portion and the bale accumulating portion to the ground surface or whether the agricultural bale accumulator is ready to discharge the plurality of bales accumulated on one of the bale receiving portion and the bale accumulating portion to the ground surface;  
25

when it is determined that the agricultural bale accumulator is ready to discharge the plurality of bales accumulated on both the bale receiving portion and the bale accumulating portion to the ground surface, then perform the step of:  
30

discharging the plurality of bales accumulated on both the bale receiving portion and the bale accumulating portion to the ground surface; and

when it is determined that the agricultural bale accumulator is ready to discharge the plurality of bales accumulated on one of the bale receiving portion and the bale accumulating portion to the ground surface, then perform the step of:  
35

discharging the plurality of bales accumulated on one of the bale receiving portion and the bale accumulating portion to the ground surface; and

when it is determined that the plurality of bales have not reached the predetermined position on the bale receiving portion along the bale receiving axis, then perform the step of:

discharging the plurality of bales accumulated on only the bale accumulating portion to the ground surface.

77. A method according to claim 76 wherein the step of discharging the plurality of bales accumulated on one of the bale receiving portion and the bale accumulating portion to the ground surface further comprises the step of:

determining whether the agricultural bale accumulator is ready to discharge the plurality of bales accumulated on only the bale receiving portion or only the bale accumulating portion to the ground surface;

when it is determined that the agricultural bale accumulator is ready to discharge the plurality of bales accumulated on only the bale receiving portion to the ground surface, then perform the step of:

discharging the plurality of bales accumulated on only the bale receiving portion to the ground surface; and

when it is determined that the agricultural bale accumulator is ready to discharge the plurality of bales accumulated on only the bale accumulating portion to the ground surface, then perform the step of:

discharging the plurality of bales accumulated on only the bale accumulating portion to the ground surface.

78. A method according to claim 76 further comprising the step of:

mechanically coupling the bale receiving portion from the bale accumulating portion when it is determined that the agricultural bale accumulator is ready to discharge the plurality of bales accumulated on both the bale receiving portion and the bale accumulating portion to the ground surface but before performing the step of discharging the plurality of bales accumulated on both the bale receiving portion and the bale accumulating portion to the ground surface,

wherein the step of discharging the plurality of bales accumulated on both the bale receiving portion and the bale accumulating portion to the ground surface further comprises the step of:

pivoting both the bale receiving portion and the bale accumulating portion relative to a frame between a bale receiving position and a bale discharging position, wherein both the bale receiving portion and the bale accumulating portion are located in a horizontal position relative to the frame when both the bale receiving portion and the bale accumulating portion is located in the bale receiving position, wherein both the bale receiving portion and the bale accumulating portion are located in an inclined position relative to the frame when both the bale receiving portion and the bale accumulating portion are located in the bale discharging position, and wherein the step of pivoting causes both the bale receiving portion and the bale accumulating portion to pivot relative to the frame from the bale receiving position to the bale discharging position to permit a gravitational force acting on the plurality of bales to discharge the plurality of bales accumulated on both the bale receiving portion and the bale accumulating portion to the ground surface.

79. A method according to claim 76 further comprising the step of:

mechanically decoupling the bale receiving portion from the bale accumulating portion when it is determined that the agricultural bale accumulator is ready to discharge the plurality of  
5 bales accumulated on one of the bale receiving portion and the bale accumulating portion to the ground surface but before performing the step of discharging the plurality of bales accumulated on one of the bale receiving portion and the bale accumulating portion to the ground surface,

wherein the step of discharging the plurality of bales accumulated on only the bale receiving portion to the ground surface further comprises the step of:

10 pivoting only the bale receiving portion relative to a frame between a bale receiving position and a bale discharging position without the bale accumulating portion, wherein the bale receiving portion is located in a horizontal position relative to the frame when the bale receiving portion is located in the bale receiving position, wherein the bale receiving portion is located in an inclined position relative to the frame when the bale receiving portion is located in the bale  
15 discharging position, and wherein the step of pivoting causes the bale receiving portion to pivot relative to the frame from the bale receiving position to the bale discharging position to permit a gravitational force acting on the plurality of bales to discharge the plurality of bales accumulated on the bale receiving portion to the ground surface, and

wherein the step of discharging the plurality of bales accumulated on only the bale  
20 accumulating portion to the ground surface further comprises the step of:

pivoting only the bale accumulating portion relative to a frame between a bale receiving position and a bale discharging position without the bale receiving portion, wherein the bale accumulating portion is located in a horizontal position relative to the frame when the bale accumulating portion is located in the bale receiving position, wherein the bale accumulating  
25 portion is located in an inclined position relative to the frame when the bale accumulating portion is located in the bale discharging position, and wherein the step of pivoting causes the bale accumulating portion to pivot relative to the frame from the bale receiving position to the bale discharging position to permit a gravitational force acting on the plurality of bales to discharge the plurality of bales accumulated on the bale accumulating portion to the ground surface.

30 80. A method according to claim 76 further comprising the step of:

mechanically decoupling the bale receiving portion from the bale accumulating portion when it is determined that the plurality of bales have not reached the predetermined position on the bale receiving portion along the bale receiving axis but before performing the step of discharging  
35 the plurality of bales accumulated on only the bale accumulating portion to the ground surface,

wherein the step of discharging the plurality of bales accumulated on only the bale accumulating portion to the ground surface further comprises the step of:

pivoting only the bale accumulating portion relative to a frame between a bale receiving position and a bale discharging position without the bale receiving portion, wherein the  
40 bale accumulating portion is located in a horizontal position relative to the frame when the bale

accumulating portion is located in the bale receiving position, wherein the bale accumulating portion is located in an inclined position relative to the frame when the bale accumulating portion is located in the bale discharging position, and wherein the step of pivoting causes the bale accumulating portion to pivot relative to the frame from the bale receiving position to the bale discharging position to permit a gravitational force acting on the plurality of bales to discharge the plurality of bales accumulated on the bale accumulating portion to the ground surface.

5



## Bale Speed Discharge Control Module:

1. An agricultural bale accumulator comprising:
  - a base module including a load bed adapted to receive thereon a plurality of bales along a  
5 bale receiving axis and adapted to accumulate thereon the plurality of bales;
  - a bale discharge module adapted to discharge the plurality of bales accumulated on the load bed from the load bed to a ground surface responsive to a gravitational force acting on the plurality of bales; and
  - a bale speed control discharge module adapted to control a rate of speed at which the  
10 plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface responsive to a rate of speed at which the agricultural bale accumulator is traveling across the ground surface.
2. An agricultural bale accumulator according to claim 1:
  - 15 wherein the agricultural bale accumulator is adapted to be pulled in tandem behind an agricultural baler in an accumulator traveling direction across the ground surface,
  - wherein the plurality of bales, including a first bale followed by a second bale, are successively ejected from a bale chamber of the agricultural baler at the first rate of speed along the bale receiving axis in a bale traveling direction essentially opposite to the accumulator traveling  
20 direction,
  - wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the load bed along the bale receiving axis in the bale traveling direction, and
  - wherein each of the plurality of bales are received on the load bed along the bale receiving  
25 axis to accumulate the plurality of bales on the load bed responsive to each of the plurality of bales being completely formed and ejected from the bale chamber of the agricultural baler.
3. An agricultural bale accumulator according to claim 1 wherein the bale speed control discharge module further comprises:
  - 30 a speed sensing mechanism adapted to determine a rate of speed at which the agricultural bale accumulator is traveling across the ground surface; and
  - a bale speed controller adapted to control the rate of speed at which the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface responsive to the determined rate of speed at which the agricultural bale accumulator is traveling across the  
35 ground surface.
4. An agricultural bale accumulator according to claim 1 wherein the bale speed control discharge module further comprises:

a bale position sensor adapted to determine a time when the plurality of bales accumulated on the load bed first contact the ground surface as the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface; and

a bale speed controller adapted to control the rate of speed at which the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface responsive to the time when the plurality of bales accumulated on the load bed first contact the ground surface.

5. An agricultural bale accumulator according to claim 1 wherein the bale speed control discharge module decreases the rate of speed at which the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface by applying a negative force on the plurality of bales accumulated on the load bed which opposes at least a portion of the gravitational force acting on the plurality of bales accumulated on the load bed.

6. An agricultural bale accumulator according to claim 1 wherein the bale speed control discharge module increases the rate of speed at which the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface by applying a positive force on the plurality of bales accumulated on the load bed which aids the gravitational force acting on the plurality of bales accumulated on the load bed.

7. An agricultural bale accumulator according to claim 1 wherein the bale speed control discharge module further comprises:

at least one cylinder having a circumferential surface and having an axis of rotation, wherein the at least one cylinder is disposed substantially coplanar with the load bed and positioned at a side of the load bed where the plurality of bales accumulated on the load bed are to be discharged;

friction providing means disposed on the circumferential surface of the at least one cylinder and adapted to provide friction between the at least one cylinder and the plurality of bales accumulated on the load bed as the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface; and

a bale speed controller coupled to the at least one cylinder and adapted to control a rotation of the at least one cylinder about the axis of rotation to permit the rotation of the at least one cylinder and the friction providing means to control the rate of speed at which the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface.

8. An agricultural bale accumulator according to claim 7 wherein the friction providing means further comprises:

a plurality of spikes disposed on the circumferential surface of the at least one cylinder and projecting radially outward from the axis of rotation of the at least one cylinder.

9. An agricultural bale accumulator according to claim 1:  
wherein the base module further comprises:

a frame adapted to support the load bed above a ground surface, and

wherein the bale discharge module further comprises:

- 5 a pivot mechanism mechanically coupled to the frame and adapted to pivot the load bed between a bale receiving position and a bale discharging position, wherein the load bed is located in a horizontal position relative to a horizontal plane when the load bed is located in the bale receiving position, wherein the load bed is located in an inclined position relative to the horizontal plane when the load bed is located in the bale discharging position, and wherein the  
10 pivot mechanism pivots the load bed relative to the frame from the bale receiving position to the bale discharging position to permit the gravitational force acting on the plurality of bales to discharge the plurality of bales accumulated on the load bed to the ground surface.

10. An agricultural bale accumulator according to claim 1 further comprising:

- 15 a bale transfer module adapted to transfer the plurality of bales received on the load bed across the load bed along a bale transfer axis horizontally traverse to the bale receiving axis to accumulate the plurality of bales in a side-by-side relationship on the load bed.

11. An agricultural bale accumulator according to claim 1 further comprising:

- 20 a bale stacking module adapted to form at least one stack of bales, having at least two bales, on the load bed along a bale stacking axis disposed vertically transverse to the bale receiving axis responsive to receiving the plurality of bales on the load bed.

12. An agricultural bale accumulator comprising:

- 25 a base module including a load bed adapted to receive thereon a plurality of bales along a bale receiving axis;

a bale stacking module adapted to form at least one stack of bales, having at least two bales, on the load bed along a bale stacking axis disposed vertically transverse to the bale receiving axis responsive to receiving the plurality of bales on the load bed;

- 30 a bale transfer module adapted to transfer the at least one stack of bales across the load bed along a bale transfer axis horizontally traverse to the bale receiving axis to accumulate the at least one stack of bales in a side-by-side relationship on the load bed;

- a bale discharge module adapted to discharge the at least one stack of bales accumulated on the load bed from the load bed to a ground surface responsive to a gravitational force acting on the  
35 at least one stack of bales; and

a bale speed control discharge module adapted to control a rate of speed at which the at least one stack of bales accumulated on the load bed is discharged from the load bed to the ground surface responsive to a rate of speed at which the agricultural bale accumulator is traveling across the ground surface.

13. An agricultural bale accumulator according to claim 12:

wherein the agricultural bale accumulator is adapted to be pulled in tandem behind an agricultural baler in an accumulator traveling direction across the ground surface,

5 wherein the plurality of bales, including a first bale followed by a second bale, are successively ejected from a bale chamber of the agricultural baler at the first rate of speed along the bale receiving axis in a bale traveling direction essentially opposite to the accumulator traveling direction,

10 wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the load bed along the bale receiving axis in the bale traveling direction, and

wherein each of the plurality of bales are received on the load bed along the bale receiving axis to accumulate the plurality of bales on the load bed responsive to each of the plurality of bales being completely formed and ejected from the bale chamber of the agricultural baler.

15 14. An agricultural bale accumulator according to claim 12 wherein the bale speed control discharge module further comprises:

a speed sensing mechanism adapted to determine a rate of speed at which the agricultural bale accumulator is traveling across the ground surface; and

20 a bale speed controller adapted to control the rate of speed at which the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface responsive to the determined rate of speed at which the agricultural bale accumulator is traveling across the ground surface.

25 15. An agricultural bale accumulator according to claim 12 wherein the bale speed control discharge module further comprises:

a bale position sensor adapted to determine a time when the plurality of bales accumulated on the load bed first contact the ground surface as the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface; and

30 a bale speed controller adapted to control the rate of speed at which the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface responsive to the time when the plurality of bales accumulated on the load bed first contact the ground surface.

35 16. An agricultural bale accumulator according to claim 12 wherein the bale speed control discharge module decreases the rate of speed at which the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface by applying a negative force on the plurality of bales accumulated on the load bed which opposes at least a portion of the gravitational force acting on the plurality of bales accumulated on the load bed.

17. An agricultural bale accumulator according to claim 12 wherein the bale speed control discharge module increases the rate of speed at which the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface by applying a positive force on the plurality of bales accumulated on the load bed which aids the gravitational force acting on the plurality of bales accumulated on the load bed.

18. An agricultural bale accumulator according to claim 12 wherein the bale speed control discharge module further comprises:

at least one cylinder having a circumferential surface and having an axis of rotation, wherein the at least one cylinder is disposed substantially coplanar with the load bed and positioned at a side of the load bed where the plurality of bales accumulated on the load bed are to be discharged;

friction providing means disposed on the circumferential surface of the at least one cylinder and adapted to provide friction between the at least one cylinder and the plurality of bales accumulated on the load bed as the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface; and

a bale speed controller coupled to the at least one cylinder and adapted to control a rotation of the at least one cylinder about the axis of rotation to permit the rotation of the at least one cylinder and the friction providing means to control the rate of speed at which the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface.

19. An agricultural bale accumulator according to claim 18 wherein the friction providing means further comprises:

a plurality of spikes disposed on the circumferential surface of the at least one cylinder and projecting radially outward from the axis of rotation of the at least one cylinder.

20. An agricultural bale accumulator according to claim 12:

wherein the base module further comprises:

a frame adapted to support the load bed above a ground surface, and

wherein the bale discharge module further comprises:

a pivot mechanism mechanically coupled to the frame and adapted to pivot the load bed between a bale receiving position and a bale discharging position, wherein the load bed is located in a horizontal position relative to a horizontal plane when the load bed is located in the bale receiving position, wherein the load bed is located in an inclined position relative to the horizontal plane when the load bed is located in the bale discharging position, and wherein the pivot mechanism pivots the load bed relative to the frame from the bale receiving position to the bale discharging position to permit the gravitational force acting on the plurality of bales to discharge the plurality of bales accumulated on the load bed to the ground surface.

21. An agricultural bale accumulator adapted to be pulled in tandem behind an agricultural baler in an accumulator traveling direction across the ground surface, the agricultural bale accumulator comprising:

a base module comprising:

5 a frame supported above a ground surface.

a load bed adapted to be supported by the frame above the ground surface, adapted to receive thereon a plurality of bales along a bale receiving axis, wherein the plurality of bales, including a first bale followed by a second bale, are successively ejected from a bale chamber of the agricultural baler at the first rate of speed along the bale receiving axis in a bale traveling  
10 direction essentially opposite to the accumulator traveling direction, wherein the second bale contacts the first bale to eject the first bale from the bale chamber of the agricultural baler to cause the first bale to be received on the load bed along the bale receiving axis in the bale traveling direction, and wherein each of the plurality of bales are received on the load bed along the bale receiving axis to accumulate the plurality of bales on the load bed responsive to each of the  
15 plurality of bales being completely formed and ejected from the bale chamber of the agricultural baler;

a bale stacking module adapted to form at least one stack of bales, having at least two bales, on the load bed along a bale stacking axis disposed vertically transverse to the bale receiving axis responsive to receiving the plurality of bales on the load bed;

20 a bale transfer module adapted to transfer the at least one stack of bales across the load bed along a bale transfer axis horizontally traverse to the bale receiving axis to accumulate the at least one stack of bales in a side-by-side relationship on the load bed;

a bale discharge module adapted to discharge the at least one stack of bales accumulated on the load bed from the load bed to a ground surface responsive to a gravitational force acting on the  
25 at least one stack of bales, wherein the bale discharge module further comprises:

a pivot mechanism mechanically coupled to the frame and adapted to pivot the load bed between a bale receiving position and a bale discharging position, wherein the load bed is located in a horizontal position relative to a horizontal plane when the load bed is located in the bale receiving position, wherein the load bed is located in an inclined position relative to the  
30 horizontal plane when the load bed is located in the bale discharging position, and wherein the pivot mechanism pivots the load bed relative to the frame from the bale receiving position to the bale discharging position to permit the gravitational force acting on the at least one stack of bales to discharge the at least one stack of bales accumulated on the load bed to the ground surface; and

a bale speed control discharge module comprising:

35 at least one cylinder having a circumferential surface and having an axis of rotation, wherein the at least one cylinder is disposed substantially coplanar with the load bed and positioned at a side of the load bed where the plurality of bales accumulated on the load bed are to be discharged;

friction providing means disposed on the circumferential surface of the at least one  
40 cylinder and adapted to provide friction between the at least one cylinder and the plurality of bales

accumulated on the load bed as the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface;

a bale speed controller coupled to the at least one cylinder and adapted to control a rotation of the at least one cylinder about the axis of rotation to permit the rotation of the at least one cylinder and the friction providing means to control a rate of speed at which the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface responsive to a rate of speed at which the agricultural bale accumulator is traveling across the ground surface.

22. An agricultural bale accumulator according to claim 21 wherein the bale speed control discharge module further comprises:

a speed sensing mechanism adapted to determine the rate of speed at which the agricultural bale accumulator is traveling across the ground surface,

- wherein the bale speed controller is adapted to control the rate of speed at which the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface responsive to the determined rate of speed at which the agricultural bale accumulator is traveling across the ground surface.

23. An agricultural bale accumulator according to claim 21 wherein the bale speed control discharge module further comprises:

a bale position sensor adapted to determine a time when the plurality of bales accumulated on the load bed first contact the ground surface as the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface,

- wherein the bale speed controller is adapted to control the rate of speed at which the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface responsive to the time when the plurality of bales accumulated on the load bed first contact the ground surface.

24. An agricultural bale accumulator according to claim 21 wherein the bale speed control discharge module decreases the rate of speed at which the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface by applying a negative force on the plurality of bales accumulated on the load bed which opposes at least a portion of the gravitational force acting on the plurality of bales accumulated on the load bed.

25. An agricultural bale accumulator according to claim 21 wherein the bale speed control discharge module increases the rate of speed at which the plurality of bales accumulated on the load bed are discharged from the load bed to the ground surface by applying a positive force on the plurality of bales accumulated on the load bed which aids the gravitational force acting on the plurality of bales accumulated on the load bed.

26. An agricultural bale accumulator according to claim 21 wherein the friction providing means further comprises:

5 a plurality of spikes disposed on the circumferencial surface of the at least one cylinder and projecting radially outward from the axis of rotation of the at least one cylinder.



## Field Location Control Module:

1. An agricultural bale accumulator comprising:  
a field position locator module comprising:
  - 5 a field position locator adapted to determine a position of the agricultural bale accumulator in a field; and
  - a controller adapted to control an operation of the agricultural bale accumulator responsive to the position of the agricultural bale accumulator in a field.
- 10 2. An agricultural bale accumulator according to claim 1 wherein the agricultural bale accumulator further comprises:
  - a base module including a load bed adapted to receive a plurality of bales along a bale receiving axis and adapted to accumulate thereon the plurality of bales,
  - wherein the controller controls the operation of the agricultural bale accumulator by the
  - 15 controlling the receipt and accumulation of the plurality of bales on the load bed.
3. An agricultural bale accumulator according to claim 2 wherein the agricultural bale accumulator further comprises:
  - a bale transfer module adapted to transfer the plurality of bales across the load bed along a
  - 20 bale transfer axis horizontally transverse to the bale receiving axis responsive to the plurality of bales being received on the load bed,
  - wherein the controller controls the receipt and accumulation of the plurality of bales on the load bed by controlling the transfer the plurality of bales across the load bed.
- 25 4. An agricultural bale accumulator according to claim 2 wherein the agricultural bale accumulator further comprises:
  - a bale stacking module adapted to form at least one stack of bales, including at least two bales of the plurality of bales, along a bale stacking axis vertically transverse to the bale receiving axis responsive to the plurality of bales being received on the load bed,
  - 30 wherein the controller controls the receipt and accumulation of the plurality of bales on the load bed by controlling a formation of at least one stack of bales.
5. An agricultural bale accumulator according to claim 2 wherein the agricultural bale accumulator further comprises:
  - 35 a bale arrangement module adapted to arrange the plurality of bales on the load bed responsive to the plurality of bales being received on the load bed,
  - wherein the controller controls the receipt and accumulation of the plurality of bales on the load bed by controlling an arrangement of the plurality of bales on the load bed.

6. An agricultural bale accumulator according to claim 2 wherein the agricultural bale accumulator further comprises:

a bale stabilization module adapted to stabilize the plurality of bales accumulated on the load,

wherein the controller controls the receipt and accumulation of the plurality of bales on the load bed by stabilizing the plurality of bales accumulated on the load.

7. An agricultural bale accumulator according to claim 2 wherein the agricultural bale accumulator further comprises:

a bale advancement module adapted to advance the plurality of bales accumulated on the load,

wherein the controller controls the receipt and accumulation of the plurality of bales on the load bed by controlling the advancement of the plurality of bales accumulated on the load.

8. An agricultural bale accumulator according to claim 1 wherein the agricultural bale accumulator further comprises:

a base module including a load bed adapted to receive a plurality of bales along a bale receiving axis and adapted to accumulate thereon the plurality of bales; and

a bale discharge module adapted to discharge the plurality of bales accumulated on the load bed to a ground surface,

wherein the controller controls the operation of the agricultural bale accumulator by the controlling the discharge the plurality of bales accumulated on the load bed to a ground surface.

9. An agricultural bale accumulator according to claim 8 wherein the agricultural bale accumulator further comprises:

a permissive bale discharge module adapted to discharge at least one bale of the plurality of bales accumulated on the load along the bale receiving axis to be discharged to the ground surface,

wherein the controller controls the discharge of the plurality of bales accumulated on the load bed to the ground surface by controlling the permissive bale discharge module.

10. An agricultural bale accumulator according to claim 8 wherein the agricultural bale accumulator further comprises:

a selective bale discharge module adapted to discharge at least one bale of the plurality of bales accumulated on the load along the bale receiving axis to be discharged to the ground surface,

wherein the controller controls the discharge of the plurality of bales accumulated on the load bed to the ground surface by controlling the selective bale discharge module.

11. An agricultural bale accumulator according to claim 8 wherein the agricultural bale accumulator further comprises:

a bale advancement module adapted to advance the plurality of bales accumulated on the load bed,

wherein the controller controls the discharge of the plurality of bales accumulated on the load bed to the ground surface by controlling the advancement of the plurality of bales accumulated on the load.

12. An agricultural bale accumulator according to claim 8 wherein the agricultural bale accumulator further comprises:

a bale speed control discharge module adapted to control a rate of speed at which the plurality of bales are discharged from the load bed to the ground surface responsive to a forward traveling speed of the agricultural bale accumulator,

wherein the controller controls the discharge of the plurality of bales accumulated on the load bed to the ground surface by controlling the rate of speed at which the plurality of bales are discharged from the load bed to the ground surface.

13. A method for operation an agricultural bale accumulator comprising the steps of:

receiving and accumulating a plurality of bales by the agricultural bale accumulator;

determining a location of the agricultural bale accumulator located in a field; and

discharging the plurality of bales received and accumulated by the agricultural bale accumulator to a ground surface of the field responsive to the location of the agricultural bale accumulator in the field.

14. A method according to claim 13 wherein the step of determining the location of the agricultural bale accumulator in the field further comprises the step of:

receiving a plurality of input signals transmitted by a plurality of satellites located around earth; and

processing the plurality of input signals to produce a location signal indicative of the location of the agricultural bale accumulator in the field,

wherein the step of discharging is responsive to the location signal.

15. A method according to claim 13 wherein the step of determining the location of the agricultural bale accumulator in the field further comprises the step of:

receiving an initialization signal indicative of a starting location of the agricultural bale accumulator in the field;

receiving an input signal from a compass;

determining a distance traveled by the agricultural bale accumulator in the field; and

processing the initialization signal, the input signal from the compass and the distance traveled by the agricultural bale accumulator in the field to produce a location signal indicative of the location of the agricultural bale accumulator in the field,

wherein the step of discharging is responsive to the location signal.

16. A method according to claim 13 wherein the step of determining the location of the agricultural bale accumulator in the field further comprises the step of:

5 receiving a manual input signal from an operator of the agricultural bale accumulator.

17. A method according to claim 13 wherein the step of discharging further comprises the steps of:

10 determining a present number of bales received and accumulated on the agricultural bale accumulator;

determining a past distance traveled by the agricultural bale accumulator in the field while the present number of bales were received and accumulated on the agricultural bale accumulator;

15 determining an average number of bales received and accumulated on the agricultural bale accumulator over the past distance traveled by the agricultural bale accumulator in the field responsive to the present number of bales received and accumulated on the agricultural bale accumulator and the past distance traveled by the agricultural bale accumulator in the field;

determining whether the present number of bales received and accumulated on the agricultural bale accumulator is equal to or less than a predetermined bale accumulating capacity of the agricultural bale accumulator;

20 when it is determined that the present number of bales received and accumulated on the agricultural bale accumulator is equal to the predetermined bale accumulating capacity of the agricultural bale accumulator, then perform the step of:

25 determining whether the agricultural bale accumulator is located in or has recently passed through at least one predetermined bale discharge zone located in the field responsive to the location of the agricultural bale accumulator in the field;

when it is determined that the agricultural bale accumulator is located in or has recently passed through the at least one predetermined bale discharge zone, then perform the step of:

30 discharging the present number of bales received and accumulated on the agricultural bale accumulator to the ground surface in or near the at least one predetermined bale discharge zone;

when it is determined that the agricultural bale accumulator is not located in or has not recently passed through the at least one predetermined bale discharge zone, then perform the steps of:

35 discharging some of the present number of bales received and accumulated on the agricultural bale accumulator to the ground surface prior to reaching a next predetermined bale discharge zone to be reached by the agricultural bale accumulator as the agricultural bale accumulator travels a remaining distance from a present location of the agricultural bale accumulator in the field to the next predetermined bale discharge zone responsive to the location of

the agricultural bale accumulator in the field and a location of the next predetermined bale discharge zone; and

continuing with the step of receiving and accumulating the plurality of bales on the agricultural bale accumulator;

5           when it is determined that the present number of bales received and accumulated on the agricultural bale accumulator is less than the predetermined bale accumulating capacity of the agricultural bale accumulator, then perform the step of:

                  determining whether the agricultural bale accumulator is located in or has recently passed through the at least one predetermined bale discharge zone;

10           when it is determined that the agricultural bale accumulator is located in or has recently passed through the at least one predetermined bale discharge zone, then perform the step of:

                  discharging the present number of bales received and accumulated on the agricultural bale accumulator from the agricultural bale accumulator to the ground surface in or near the at least one predetermined bale discharge zone;

                  when it is determined that the agricultural bale accumulator is not located in or has not recently passed through the at least one predetermined bale discharge zone, then continuing with the step of:

20           receiving and accumulating the plurality of bales on the agricultural bale accumulator.

18.   A method according to claim 17 wherein the step of discharging some of the present number of bales received and accumulated on the agricultural bale accumulator to the ground surface prior to reaching the next predetermined bale discharge zone further comprises the steps of:

25           determining the remaining distance between the present location of the agricultural bale accumulator in the field and the next predetermined bale discharge zone in the field to be reached by the agricultural bale accumulator responsive to the location of the agricultural bale accumulator in the field and the location of the next predetermined bale discharge zone in the field;

30           estimating a future number of bales to be received and accumulated on the agricultural bale accumulator over the remaining distance between the present location of the agricultural bale accumulator in the field and the next predetermined bale discharge zone to be reached by the agricultural bale accumulator responsive to the average number of bales received and accumulated on the agricultural bale accumulator over the past distance traveled by the agricultural bale accumulator in the field and the remaining distance between the present location of the agricultural bale accumulator in the field and the next predetermined bale discharge zone; and

35           discharging the estimated future number of bales to be received and accumulated on the agricultural bale accumulator from the load bed to a ground surface prior to reaching the next predetermined bale discharge zone as the agricultural bale accumulator travels the remaining

distance from the present location of the agricultural bale accumulator in the field to the next predetermined bale discharge zone.

19. A method according to claim 17 further comprises the step of:

5 determining whether a future number of bales that the agricultural bale accumulator can receive and accumulate before the agricultural bale accumulator reaches the next predetermined bale discharge zone is greater than a remaining number of bales that the agricultural bale accumulator can receive and accumulate before reaching the predetermined bale accumulating capacity of the agricultural bale accumulator responsive to determining that the present number of  
10 bales received and accumulated on the agricultural bale accumulator is less than the predetermined bale accumulating capacity of the agricultural bale accumulator but prior to the step of discharging the present number of bales received and accumulated on the agricultural bale accumulator from the agricultural bale accumulator to the ground surface in or near the at least one predetermined bale discharge zone.

15 20. A method according to claim 19 wherein the step of determining whether the future number of bales that the agricultural bale accumulator can receive and accumulate before the agricultural bale accumulator reaches the next predetermined bale discharge zone is greater than the remaining number of bales that the agricultural bale accumulator can receive and accumulate before  
20 reaching the predetermined bale accumulating capacity of the agricultural bale accumulator further comprises the steps of:

subtracting the present number of bales received and accumulated on the agricultural bale accumulator from the predetermined bale accumulating capacity of the agricultural bale accumulator to determine the remaining number of bales that the agricultural bale accumulator can  
25 receive and accumulate before the predetermined bale accumulating capacity of the agricultural bale accumulator reaches its maximum limit;

determining a remaining distance between a present location of the agricultural bale accumulator in the field and the next predetermined bale discharge zone to be reached by the agricultural bale accumulator;

30 multiplying the average number of bales received and accumulated on the agricultural bale accumulator over the distance traveled by the agricultural bale accumulator in the field by the remaining distance between a present location of the agricultural bale accumulator in the field and the next predetermined bale discharge zone to be reached by the agricultural bale accumulator to determine the future number of bales that the agricultural bale accumulator can receive and  
35 accumulate before the agricultural bale accumulator reaches the next predetermined bale discharge zone;

when it is determined that the future number of bales that the agricultural bale accumulator can receive and accumulate before the agricultural bale accumulator reaches the next predetermined bale discharge zone is greater than a remaining number of bales that the agricultural bale

accumulator can receive and accumulate before reaching the predetermined bale accumulating capacity of the agricultural bale accumulator, then perform the step of:

discharging the present number of bales received and accumulated on the agricultural bale accumulator from the agricultural bale accumulator to the ground surface in or near the at least one predetermined bale discharge zone;

when it is determined that the future number of bales that the agricultural bale accumulator can receive and accumulate before the agricultural bale accumulator reaches the next predetermined bale discharge zone is not greater than a remaining number of bales that the agricultural bale accumulator can receive and accumulate before reaching the predetermined bale accumulating capacity of the agricultural bale accumulator, then continuing to perform the step of:

receiving and accumulating the plurality of bales on the agricultural bale accumulator.

21. A method for operation an agricultural bale accumulator comprising the steps of:

receiving and accumulating a plurality of bales by the agricultural bale accumulator;  
determining a location of the agricultural bale accumulator located in a field; and

discharging the plurality of bales received and accumulated by the agricultural bale accumulator to a ground surface of the field responsive to the location of the agricultural bale accumulator in the field, wherein the step of discharging further comprises the steps of:

determining a present number of bales received and accumulated on the agricultural bale accumulator;

determining a past distance traveled by the agricultural bale accumulator in the field while the present number of bales were received and accumulated on the agricultural bale accumulator;

determining an average number of bales received and accumulated on the agricultural bale accumulator over the past distance traveled by the agricultural bale accumulator in the field responsive to the present number of bales received and accumulated on the agricultural bale accumulator and the past distance traveled by the agricultural bale accumulator in the field;

determining whether the present number of bales received and accumulated on the agricultural bale accumulator is equal to or less than a predetermined bale accumulating capacity of the agricultural bale accumulator;

when it is determined that the present number of bales received and accumulated on the agricultural bale accumulator is equal to the predetermined bale accumulating capacity of the agricultural bale accumulator, then perform the step of:

determining whether the agricultural bale accumulator is located in or has recently passed through at least one predetermined bale discharge zone located in the field responsive to the location of the agricultural bale accumulator in the field;

when it is determined that the agricultural bale accumulator is located in or has recently passed through the at least one predetermined bale discharge zone, then perform the step of:

discharging the present number of bales received and accumulated on the agricultural bale accumulator to the ground surface in or near the at least one predetermined bale discharge zone;

when it is determined that the agricultural bale accumulator is not located in or has not recently passed through the at least one predetermined bale discharge zone, then perform the steps of:

discharging some of the present number of bales received and accumulated on the agricultural bale accumulator to the ground surface prior to reaching a next predetermined bale discharge zone to be reached by the agricultural bale accumulator as the agricultural bale accumulator travels a remaining distance from a present location of the agricultural bale accumulator in the field to the next predetermined bale discharge zone responsive to the location of the agricultural bale accumulator in the field and a location of the next predetermined bale discharge zone, wherein the step of discharging some of the present number of bales further comprises the steps of:

determining the remaining distance between the present location of the agricultural bale accumulator in the field and the next predetermined bale discharge zone in the field to be reached by the agricultural bale accumulator responsive to the location of the agricultural bale accumulator in the field and the location of the next predetermined bale discharge zone in the field;

estimating a future number of bales to be received and accumulated on the agricultural bale accumulator over the remaining distance between the present location of the agricultural bale accumulator in the field and the next predetermined bale discharge zone to be reached by the agricultural bale accumulator responsive to the average number of bales received and accumulated on the agricultural bale accumulator over the past distance traveled by the agricultural bale accumulator in the field and the remaining distance between the present location of the agricultural bale accumulator in the field and the next predetermined bale discharge zone; and

discharging the estimated future number of bales to be received and accumulated on the agricultural bale accumulator from the load bed to a ground surface prior to reaching the next predetermined bale discharge zone as the agricultural bale accumulator travels the remaining distance from the present location of the agricultural bale accumulator in the field to the next predetermined bale discharge zone.; and continue to perform the step of:

receiving and accumulating the plurality of bales on the agricultural bale accumulator;

when it is determined that the present number of bales received and accumulated on the agricultural bale accumulator is less than the predetermined bale accumulating capacity of the agricultural bale accumulator, then perform the step of:

determining whether the agricultural bale accumulator is located in or has recently passed through the at least one predetermined bale discharge zone;



when it is determined that the agricultural bale accumulator is located in or has recently passed through the at least one predetermined bale discharge zone, then perform the steps of:

determining whether a future number of bales that the agricultural bale accumulator can receive and accumulate before the agricultural bale accumulator reaches the next predetermined bale discharge zone is greater than a remaining number of bales that the agricultural bale accumulator can receive and accumulate before reaching the predetermined bale accumulating capacity of the agricultural bale accumulator;

when it is determined that the future number of bales that the agricultural bale accumulator can receive and accumulate before the agricultural bale accumulator reaches the next predetermined bale discharge zone is greater than a remaining number of bales that the agricultural bale accumulator can receive and accumulate before reaching the predetermined bale accumulating capacity of the agricultural bale accumulator, then perform the step of:

discharging the present number of bales received and accumulated on the agricultural bale accumulator from the agricultural bale accumulator to the ground surface in or near the at least one predetermined bale discharge zone;

when it is determined that the future number of bales that the agricultural bale accumulator can receive and accumulate before the agricultural bale accumulator reaches the next predetermined bale discharge zone is not greater than a remaining number of bales that the agricultural bale accumulator can receive and accumulate before reaching the predetermined bale accumulating capacity of the agricultural bale accumulator, then continuing to perform the step of:

receiving and accumulating the plurality of bales on the agricultural bale accumulator;

when it is determined that the agricultural bale accumulator is not located in or has not recently passed through the at least one predetermined bale discharge zone, then continuing to perform the step of:

receiving and accumulating the plurality of bales on the agricultural bale accumulator.

22. A method according to claim 21 wherein the step of determining whether the future number of bales that the agricultural bale accumulator can receive and accumulate before the agricultural bale accumulator reaches the next predetermined bale discharge zone is greater than the remaining number of bales that the agricultural bale accumulator can receive and accumulate before reaching the predetermined bale accumulating capacity of the agricultural bale accumulator further comprises the steps of:

subtracting the present number of bales received and accumulated on the agricultural bale accumulator from the predetermined bale accumulating capacity of the agricultural bale accumulator to determine the remaining number of bales that the agricultural bale accumulator can

receive and accumulate before the predetermined bale accumulating capacity of the agricultural bale accumulator reaches its maximum limit;

5 determining a remaining distance between a present location of the agricultural bale accumulator in the field and the next predetermined bale discharge zone to be reached by the agricultural bale accumulator;

10 multiplying the average number of bales received and accumulated on the agricultural bale accumulator over the distance traveled by the agricultural bale accumulator in the field by the remaining distance between a present location of the agricultural bale accumulator in the field and the next predetermined bale discharge zone to be reached by the agricultural bale accumulator to determine the future number of bales that the agricultural bale accumulator can receive and accumulate before the agricultural bale accumulator reaches the next predetermined bale discharge zone.